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A Comparison of the Effects of Two PBIS Token Reinforcement Systems on Appropriately-Engaged Behavior

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The University of Southern Mississippi

A COMPARISON OF THE EFFECTS OF TWO
PBIS TOKEN REINFORCEMENT SYSTEMS ON
APPROPRIATELY-ENGAGED BEHAVIOR

by

Kathryn Marie Menousek

Abstract of a Dissertation
Submitted to the Graduate School
of The University of Southern Mississippi
in Partial Fulfillment of the Requirements
for the Degree of Doctor of Philosophy

August 2011

ABSTRACT

A COMPARISON OF THE EFFECTS OF TWO
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by Kathryn Marie Menousek

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The purpose of the present study was to compare the effects of two token reinforcement systems typically used in Positive Behavior Intervention and Supports (PBIS) within-class procedures on Appropriately Engaged Behavior (AEB). A nonconcurrent multiple baseline comparison across four classrooms was utilized to assess and compare each classroom's mean percentage of observed intervals of appropriately engaged behavior across intervention phases and to assess for crossover effects. Each classroom's mean percentage of observed intervals of AEB across two different intervention phases, including a store and a lottery, was assessed and compared. Results suggested that both interventions (i.e., store and lottery) were effective at increasing students' mean percentage of AEB compared to baseline levels. However, differences between the two interventions were neither substantial nor significant.

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DEDICATION

This dissertation is dedicated to my wonderful parents who have supported me through all of my endeavors. To my father, I am thankful that you have been there to help guide me through this process. To my mother, I am thankful that you were there to encourage me throughout my graduate school career. Although I wish that you could be there to see the end of this process, I know that you will always be with me in my heart Mom. I love you both more than you will ever know, and I could not have done any of this without your love and support.

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CHAPTER I

INTRODUCTION

Schools are required by the Individuals with Disabilities Education Act of 2004 (IDEA, 2004) and No Child Left Behind Act (NCLB; 2004) to reform efforts to increase student achievement and to provide students with positive intervention approaches to address behavior. Specifically, the use of Positive Behavior Intervention and Supports (PBIS) is encouraged in IDEA in lieu of typically used reactive, punishment-based approaches to addressing students in need of behavioral support. Numerous years of research demonstrating the effectiveness of procedures utilized in PBIS are documented (Ayllon & Azrin, 1965; Baer, Wolf, & Risley, 1968; Boostrom, 1991; Boren & Colman, 1970; Brophy, 1983; Crawford, Vancouver, & McLaughlin, 1982; Emmer, Evertson, & Anderson, 1980; Filcheck, McNeil, Greco, & Bernard, 2004; Gettinger, 1988; Hebert, 1997; Johnson, Stoner, & Green, 1996; Kazdin, 1977; McLaughlin & Malaby, 1972, 1975a, 1975b, 1976; Meichenbaum, Bowers, & Ross, 1968). Under IDEA, schools are also required to provide early intervention services to students not identified as needing special education, but who require additional academic and/or behavioral support to succeed in the general education environment (George, White, & Schlaffer, 2007; IDEA, 2001). Furthermore, IDEA requires schools to provide these identified students with scientifically-based interventions.

Although PBIS is adopted in over 9,000 schools throughout the United States (Sprague & Horner, 2008), questions regarding quality of implementation and critical intervention components are prevalent and growing in number every day. Sugai and Horner (2008) indicated that in order for PBIS to be adopted nationally, more research

demonstrating the effective adoption and integration of evidence-based practices is warranted. In addition, Sugai and Horner indicated that research is needed to aid in identifying variables that are the most efficient in improving students' quality of life both academically and socially.

The following section details the fundamental principles of PBIS and the procedures involved in successful PBIS implementation. In addition, previous literature that provides examples of successful implementation of PBIS both at the school-wide and classroom level is discussed. Also, measures of the effectiveness of PBIS implementation and overall outcomes are discussed in terms of strengths, limitations, and areas that warrant future research. Finally, the research related to the use of two token reinforcement delivery systems typically utilized in PBIS are discussed.

The Foundation of Positive Behavior Support

PBIS was originally described by Horner et al. (1990, 2005) as nonaversive behavior procedures designed to teach skills to individuals with severe disabilities. Aversive events or stimuli were described by the authors as those that evoke avoidant or escape behaviors in individuals (Azrin & Holz, 1966; Bandura, 1969); conversely, nonaversive behavior procedures are events or stimuli that do not evoke avoidant or escape behaviors in individuals. These nonaversive strategies described by Horner et al. provided the ground work for PBIS. These strategies are currently used in schools today and involve utilizing antecedent and setting manipulations and limiting the use of punishers. Carr et al. (2002) defined PBIS as “an applied science that uses educational methods to expand individuals’ behavior repertoire and systems change methods to redesign an individual’s living environment to first enhance the individual’s quality of

life and, second, to minimize his or her problem behavior” (p. 4). In addition, Carr et al. indicated that the incorporation of nine critical features has set PBIS apart from applied behavior analysis (ABA). These critical features in PBIS include a focus on comprehensive lifestyle change and quality of life; ecological and social validity (i.e., interventions are aimed at increasing or decreasing students’ behavior so that the person’s life is changed in a meaningful way in relevant environments); stakeholder participation; systems change and multicomponent interventions; prevention; flexibility with respect to scientific practices; and multiple theoretical perspectives. The comprehensive lifestyle and quality of life features of PBIS emphasize an overall improvement of the quality of life of individuals including all relevant stakeholders (e.g., teachers, employers, parents, and friends; Carr et al., 2002). PBIS also emphasizes ecological validity, meaning that interventions and strategies employed must be feasible, relevant, and effective in real world settings.

Dunlap, Carr, Horner, Zarcone, and Schwartz (2009) further indicated that PBIS aims to attain social validity (e.g., interventions are practical, desirable, and created specifically for individuals). PBIS should focus on fixing problem contexts, not specific problem behaviors. It emphasizes prevention; interventions should be intended to minimize the future likelihood of the occurrence of problem behavior (i.e., there is the acknowledgement that the optimal time to provide intervention and support is when problem behavior is absent). PBIS is flexible with respect to other scientific practices by incorporating a wide variety of research methodology (i.e., correlational analysis, naturalistic observations, case studies, and experimental analysis). Finally, PBIS is derived from multiple theoretical perspectives; involving both the individual and systems;

emphasizing naturalistic settings rather than clinical settings; and implementing interventions that feature the collaborative process involving both scientists and stakeholders (Carr et al., 2002; Dunlap et al., 2009).

Relationship between PBIS and ABA

Horner et al. (1990) coined the term “positive behavior support” (p. 4) as an intervention developed for individuals with mental retardation and developmental delays as an alternative to more aversive interventions to decrease self-injurious and aggressive behavior (Sugai et al., 2000). Throughout the 1990s, PBIS began to be applied as an intervention process used not only for students with disabilities, but for a wider range of students, and then for an entire school population (Carr et al., 2002; Netzel & Eber, 2003). PBIS is now implemented in many school districts and is used as an application of a behaviorally-based systems approach to enhance different environments, not only including the school, but also the family and community (Sugai & Horner, 2002).

PBIS falls under the very broad umbrella of ABA in that PBIS includes the use of empirical approaches to guide decision making. Also, PBIS ideologies utilize instrumental or operant learning strategies as a conceptual foundation that “guides learning through the use of positive reinforcement, contingency management, stimulus control, shaping, fading, prompting, functional equivalence, generalization, and maintenance” (Dunlap et al., 2009, p. 687). Data collection and experimental designs in ABA and PBIS both utilize reliable direct observations. ABA principles such as reinforcement and contingency management, manipulation of stimulus control and establishing operations, functional assessment and analysis, and fading and shaping procedures are also utilized in the PBIS process. Consequently, it could be strongly

argued that the methodologies, principles, and conceptual framework of PBIS were derived from ABA.

Levels of PBIS Prevention

PBIS emphasizes prevention through a continuum of behavioral supports utilizing empirically-supported behavioral techniques (Carr et al., 2002; George et al., 2007; Sugai & Horner, 2006, 2008). PBIS focuses on the student's environment and emphasizes acknowledgment of appropriate behavior of all students in the school. The process involves the use of a multi-tiered model of service delivery that provides support to students on a needs-driven basis in attempts to achieve high rates of success for all students with varying levels of need (see Figure 1). The behavioral support continuum includes three levels of prevention. Throughout all three levels of prevention, the use of empirically-supported interventions is utilized. The three levels include the prevention of the development of problem behavior (i.e., the primary level of prevention) and the reduction of the frequency and/or the intensity of problem behaviors (i.e., secondary and tertiary prevention). Each level of prevention is designed to consider multiple contexts for intervention including students' families, schools, communities, classrooms, and nonclassrooms (i.e., the gym, cafeteria, bus, bathroom, playground, and hallway; see Figure 2). All interventions along the continuum are aimed at maximizing positive results, ensuring accountability of the school, increasing effective and efficient communication, and increasing students' progress in the general curriculum. Throughout all three levels of prevention, assessment typically involves the comparison of the number of office discipline referrals (ODRs) for each month, and progress is monitored to determine whether behavioral interventions at each level are producing desirable

effects (i.e., either increasing appropriate behavior or decreasing inappropriate or disruptive behavior).

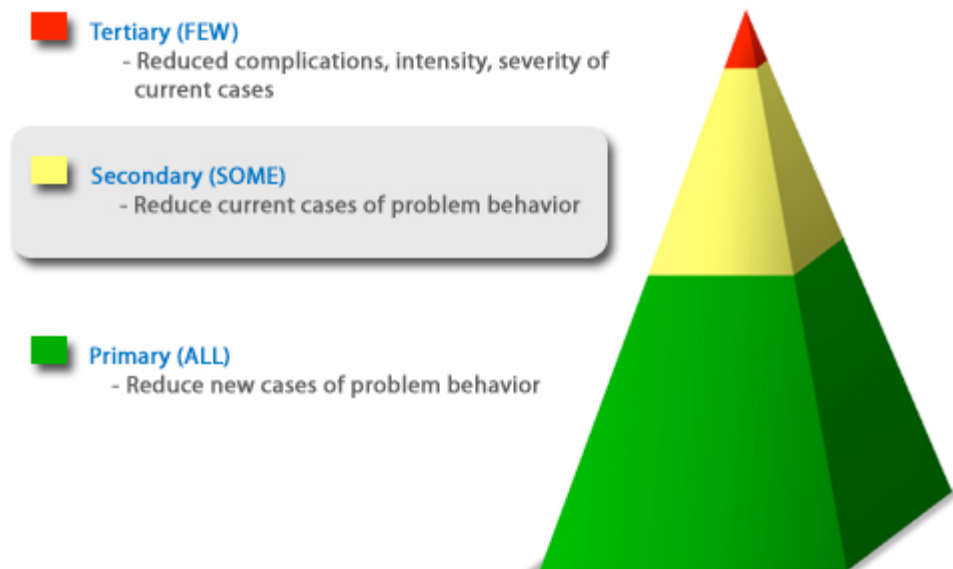


Figure 1. The Primary, Secondary, and Tertiary Levels of School-Wide Positive Behavior Intervention and Support. Adapted from “Technical Assistance Center on Positive Behavioral Interventions & Supports: Effective Schoolwide Intervention.” (n.d.). *Secondary Level Prevention*. Retrieved from <http://www.pbis.org>.

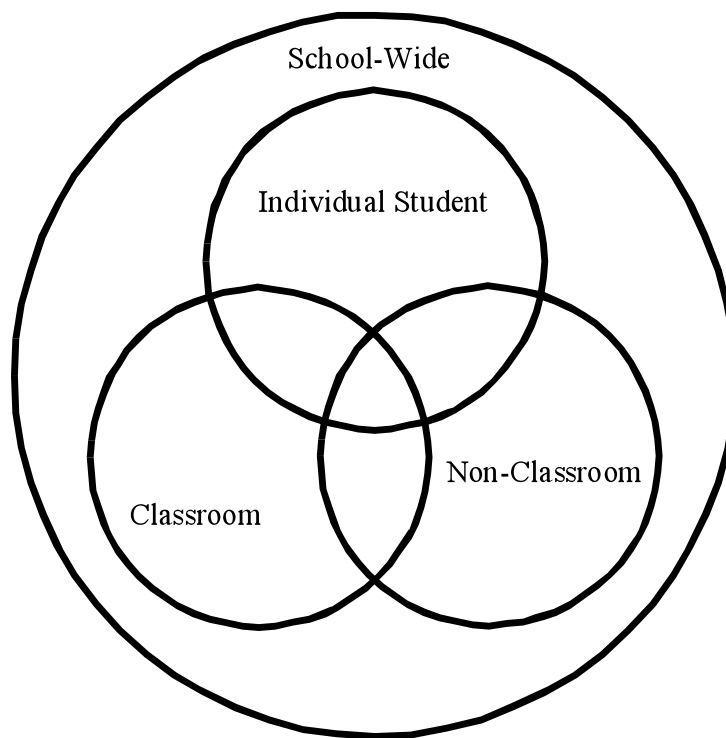


Figure 2. Multiple Systems of School-Wide Positive Behavior Support. Adapted from “Center on Positive Behavioral Interventions and Support.” (n.d.). What is a systems approach in school-wide PBS? Retrieved from <http://www.pbis.org>. Primary Level of Prevention

Primary prevention involves school-wide and classroom-wide systems and focuses on the entire student body. Sugai and Horner (2006) suggested that the primary level of prevention will successfully address the needs of approximately 80-90% of the student population; however this is not empirically-derived. One of the principles of primary level of prevention is the assumption that all students are capable of exhibiting appropriate behavior (George et al., 2007; Sugai & Horner, 2006, 2008). Other characteristics of the primary level of prevention include providing students with early intervention, monitoring student progress, and using data to guide decisions.

Primary prevention is designed to be implemented across the entire school and is aimed at changing the structural framework of all school settings to a proactive approach as opposed to a reactive approach to behavior problems (George et al., 2007; Sugai & Horner, 2006, 2008). Goals of primary prevention include enabling a common language for school staff and students, consistent application of positive and negative reinforcement for desirable behaviors, and enabling common practices across stakeholders. Another feature of the primary level of prevention of PBIS involves clearly teaching the behavioral expectations of the school to the students. This is typically achieved by providing students with 3-5 generalizeable rules or expectations that are positively stated (e.g., respect yourself, keep your hands to yourself, follow the rules the first time they are given) as opposed to negatively stated (e.g., don't hit others, don't use mean words, don't write on the desks).

The primary level of prevention also involves teaching students behaviors that are expected of them across different settings (George et al., 2007; Sugai & Horner, 2006, 2008). This can be accomplished by providing students with examples and non-examples of rules or expectations following behavior or through role modeling sessions. Finally, the primary level of prevention involves creating a procedure in which students are "caught" being good and rewarded for exhibiting appropriate behaviors. Students are typically provided a ticket or token along with specific verbal praise in attempts to increase the reoccurrence of the appropriate behavior. Although students typically are provided with verbal praise and a conditioned tangible reinforcer (e.g., a ticket, a sticker, or a point on a point card), reinforcement procedures vary from school to school and from district to district.

Secondary Level of Prevention

The secondary level of prevention addresses the approximately 5-15% of students at risk for problem behavior, although this percentage is also not empirically-derived. It is intended to involve the use of supplemental strategies including specialized group intervention and targeted time efficient individual strategies (e.g., Check In-Check Out, self-monitoring interventions; George et al., 2007; Sugai & Horner, 2006, 2008). Students provided with secondary levels of prevention receive interventions implemented by teachers and staff in addition to primary levels of prevention. Similar to the primary level of prevention, principles of secondary level of prevention include the assumption that all students are capable of exhibiting appropriate behavior, students should be provided with intervention as early as possible in order to achieve optimal outcomes, students' progress should be monitored, and data should be used to guide decision making. Finally, secondary levels of prevention should be based on the needs of the student and the resources available to the school.

Tertiary Level of Prevention

Finally, the tertiary level of prevention is designed to address students with chronic or intense behavior problems (Sugai & Horner, 2002, 2006, 2008). It is anticipated that this level of prevention will address approximately 1-7% of the student population. The tertiary level of prevention involves the use of specialized individual interventions based on individualized assessments of behavior. At this level of intervention, individual behavior intervention plans typically are developed to address the student's behavioral concern(s) because the students have failed to respond to the primary and secondary levels of prevention offered. Students at the tertiary level of prevention

are provided not only with primary (i.e., school-wide) and secondary (i.e., group or individual interventions) supports, but with individualized targeted interventions geared at reducing the intensity and/or severity of the problem behaviors engaged in by a particular student (George et al., 2007; Sugai & Horner, 2006, 2008).

Differentiation at all three levels is consistent with the PBIS procedures in that prevention occurs across school settings and is dependent on the schools' needs and resources (George et al., 2007; Sugai & Horner, 2006, 2008). Therefore, there are many ways in which schools can differ in training, planning, and implementing across all three levels of PBIS (i.e., different reinforcement strategies, expectations, and procedures). This differentiation in procedural methodology across all three levels of support, although a key component of PBIS procedures, leaves researchers with questions regarding the most effective types of interventions or strategies to reinforce students' behaviors across all three levels. It remains unclear as to what types of interventions across all three levels of prevention produce the most beneficial results for students in PBIS schools. Additional research is needed in this area.

PBIS Evaluation Measures

In order to ensure that PBIS procedures are being implemented with integrity, administrators need measures of implementation. There are a variety of ways to measure the implementation of PBIS in schools including the *School-Wide Evaluation Tool* (SET; Horner et al., 2004), and the *School-Wide Benchmarks of Quality* (BoQ; Cohen, Kincaid, & Childs, 2007; Kincaid, Childs, & George, 2005). The SET was developed with the aim of determining the extent to which schools implement PBIS with fidelity, whether training and technical assistance result in school-wide improvement in PBIS

implementation, and if implementation of PBIS is related to a substantial change in the safety, social culture, and behavior in the school. Similar to the SET, the BoQ is intended to measure the degree of the school staff's fidelity of implementation of PBIS (Cohen et al., 2007). Both instruments are intended to evaluate and review progress towards implementing PBIS with fidelity.

The tracking of office discipline referrals (ODRs) is one of the steps included on the BoQ and the SET. ODRs are typically used as an indicator of effectiveness of implementation of PBIS procedures in addition to using the SET and the BoQ (Kincaid, Knoster, Harrower, Shannon, & Bustamante, 2002; Metzler, Biglan, Rusby, & Sprague, 2001; Scott & Barrett, 2004; Walker, Cheney, Stage, & Blum, 2005). ODRs were defined by Sugai, Sprague, Horner, and Walker (2000) as:

An event in which (a) a student engaged in a behavior that violated a rule/social norm in the school, (b) a problem behavior was observed by a member of the school staff, and (c) the event resulted in a consequence delivered by administrative staff who produced a permanent (written) product defining the whole event. (p. 96)

ODRs are typically used as the dependent measure of PBIS effectiveness because they are easy to administer, are typically used prior to the introduction of PBIS, and provide important information such as the student's name, the rule that was violated, and the consequences that resulted (Sugai et al., 2000).

The use of ODRs as the primary indicator of the effectiveness of PBIS implementation is rather concerning for several reasons. The first is that ODRs fail to provide information related to increases in appropriate behavior. In addition, ODRs have

the possibility of failing to account for students experiencing internalizing problems that might not manifest themselves in an ODR (Nelson, Benner, Reid, Epstein, & Currin, 2002). While one could use the count of tokens or tokens awarded for displays of appropriate behavior by students as another indicator of appropriate behavior, this approach relies heavily upon teacher and administrator observation and acknowledgement of those exhibited behaviors. In addition, ODRs are may be inconsistently completed, unreliable, and may not be a valid indicator of the school's behavioral climate. This may lead to decreases in the reliability and validity of ODRs as an indicator of PBIS effectiveness at the individual and system-wide level.

ODRs have been used as an indicator of PBIS effectiveness at the individual level (i.e., one student) and at the system-wide level (i.e., the entire school; Sugai et al., 2000). Although major and minor infractions attempt to classify the severity of ODRs, there is still no way to verify the accuracy of teacher's judgments. ODRs rely heavily on the actions of teachers and the availability of time or resources to write up referrals, all of which may lead to a decrease in the reliability and validity of ODRs as an indicator of PBIS effectiveness. Despite all of the possible problems with ODRs, most schools that implement PBIS may not verify the accuracy of teachers' ODRs. This leaves educators without a means of assessing the accuracy of teachers' judgments of students' behaviors, thereby making it more difficult to assess the impact of PBIS. ODRs may be inconsistently completed, unreliable, and may not be a valid indicator of the school's behavioral climate. This may lead to decreases in the reliability and validity of ODRs as an indicator of PBIS effectiveness at the individual and system-wide level.

Relying solely on ODRs to assess the effectiveness of PBIS could be viewed as a shortcoming of the supporting literature.

In summary, the BoQ and SET are typically utilized as indicators of treatment integrity of implementation of PBIS procedures (Kincaid et al., 2002; Metzler et al., 2001; Scott & Barrett, 2004; Walker et al., 2005). The BoQ is a self-assessment and the SET is an independent assessment. These measures fail to assess the classroom-wide effectiveness of PBIS procedures. Also, these tools also fail to assess whether positive, or appropriate behavior is in fact increasing. Therefore, the BoQ and SET are not appropriate tools to measure whether appropriate behavior is increasing at the classroom-wide level.

System-Wide Application of PBIS

Netzel and Eber (2003) described the challenges teachers and administrators in an urban school district faced when implementing PBIS. During the first year of implementation, PBIS team members were educated on utilizing the three-tiered process of matching students to their individual level of need, using preventive approaches to decrease inappropriate behavior by teaching the use of reinforcement for appropriate behavior, and using data to resolve and problem solve areas of concern.

The team met approximately once every three weeks to create an office referral form to be used by teachers in response to discipline problems, to brainstorm possible alternatives to school suspensions, to create scripts to aid teachers in communicating the expectations to students, and to discuss expectations of school-wide behavior. In addition, the team created a strategy to reward students for demonstrating appropriate behavior in the form of “gotcha.” The “gotcha” was intended to recognize both the

students for following school-wide rules and the teacher that rewarded the students, thus serving as a measure of treatment integrity. “Gotchas” were slips of paper that provided a space for both the student and teacher’s name that was placed in a box after receipt for engaging in appropriate behavior. At the end of each week a drawing was held in which students’ names were drawn, and those names selected were provided with a prize. The authors did not note the percentage of students in the school that received a prize (Netzel & Eber, 2003).

At the beginning of the first year of implementation (i.e., the second year of the study), students were taught the expectations of PBIS. Each lesson involved students practicing the appropriate behavior(s) that complied with the expectations. Lessons usually lasted approximately 20-30 min per week. After the practice session and for the remainder of the week, teachers provided students with a “gotcha” when they were caught engaging in appropriate rule following behavior. In addition, teachers also pointed out when students demonstrated non-examples of inappropriate behavior during this time (Netzel & Eber, 2003).

Netzel and Eber (2003) encouraged teachers to treat every instance as a learning opportunity. The PBIS team took a gradual approach aimed at shifting teachers from purely reactive strategies. The team did this by educating teachers on the ineffectiveness of reactive approaches (i.e., suspension) and the effectiveness and timesaving benefits of proactive approaches (i.e., providing students with rules and expectations and rewarding students for engaging in appropriate behavior). ODRs and suspensions were the dependent variables of this study. Results demonstrated a 22% decrease in student suspensions compared to the year prior to implementation of PBIS. No ODR data were

reported for the previous academic year, since ODRs were not used prior to the implementation of PBIS. Despite the lack of baseline ODR data for comparison, staff reported that there was a fairly gradual decrease in discipline referrals throughout the course of the school year. Staff suggested that the speculated decreases in ODRs may have been attributed to the novelty of PBIS. Qualitative information from the pilot study demonstrated positive attitudes of staff toward the procedures involved in the PBIS system, improvement in the attitude of staff and students toward school climate, and an overall decrease in staff turnover. The fact that many of the conclusions of this study are based on anecdotal information is a key limitation.

There is an accumulation of literature documenting the school-wide implementation of the first years of PBIS similar to Netzel and Eber's investigation (Bohannon et al., 2006; Menendez, Payne, & Mayton, 2008; Sprague et al., 2001). Most of this literature documents the development of a PBIS team, expectations, and the data collection system. However, Scott and Barrett (2004) differ from this literature in that they measured the amount of time involved in disciplinary procedures by students and administrators in an attempt to evaluate the effectiveness of PBIS. The investigators trained five members of a PBIS team at an urban elementary school district in PBIS procedures and principles. The authors then instructed the team to introduce the procedures to the rest of the schools in the district. As part of the PBIS procedures, students were provided with tickets for engaging in appropriate behavior. Once a student obtained a ticket, he or she was then a member of the special club. Membership allowed students access to weekly and monthly celebrations or assemblies in which only those students were allowed to engage in previously purchased activities provided by the

schools' Parent/Teacher Organizations (PTO). The authors did not provide the reader with examples of the activities in which students were allowed to engage, however they did indicate that PTO and other community members contributed \$750 yearly to support the celebrations.

Using the previous year's ODR data, Scott and Barrett (2004) determined the average amount of time spent by administrators, teachers, and students in the discipline process. Based on the past years' data, an ODR was determined to cost an administrator 10 min and a student 20 min, with a suspension costing 45 min of administrator's time and up to 6 hrs of lost instructional time for a student. Loss of student time was assumed to be negatively correlated with student achievement due to the loss of instructional time. Investigators reported that the number of ODRs decreased from 608 in the baseline year to 108 in the first year and 46 in the second year of implementation. In addition, the number of student suspensions decreased from 77 during the baseline year to 32 in the first year of implementation and 22 in year two. A total of 10.4 days of administrator time was saved during the first year and 11.7 days during the second year of implementation. In addition, a total of 72.7 days of student instructional time was saved during the first year of implementation compared to the baseline year and 86.2 days during the second year compared to year one of implementation. After running fiscal analyses computing administrators' yearly salary and the average amount of money it costs to enroll one student each day of school, the investigators indicated that PBIS saved the school district \$9,106.92 during the first year of implementation and \$10,667.74 during the second.

The findings of this investigation imply that not only does PBIS enhance the learning environment, but it also decreases the amount of time and money that a school district expends in the disciplinary process. A crucial limitation of this study is that causality cannot be inferred since the study utilized a non-experimental design (Scott & Barrett, 2004).

Bohanon et al. (2006) evaluated the effects of PBIS in an urban high school that represented a culturally diverse group of students (i.e., 36% African American, 36% Hispanic, 16% Asian American, 8% Caucasian, 2% Native American, and 2% from other cultural backgrounds). The authors sought to measure both the process and outcome of implementing PBIS in an urban high school. Process measures included the SET (Horner et al., 2004) and the *Effective Behavior Support Team Implementation Checklist* (EBS; Sugai, Horner, & Todd, 2000). The first year of the study involved the teaching and organizing of the implementation of PBIS procedures. The reinforcement system employed at this school included acknowledging student behaviors by providing students with “cool tickets.” Each ticket was worth \$0.25 and could be redeemed at the high school’s food cantina where students were able to purchase small edible items (e.g., candy). In addition, after tickets were turned in to purchase food at the cantina, they were placed into a weekly lottery. Five to seven names were pulled during each weekly lottery. Those students whose names were pulled were thanked for “Doing the Right Thing” and were allowed to choose from a collection of donated items such as bags, computer software, books, and t-shirts. Outcome measures included climate survey data and ODRs.

Bohanon et al. (2006) compared the effects of PBIS between baseline (Year 2)

and implementation (Year 3) using a pre-post (AB) design. The investigators indicated that the high school had reached an overall level of 80% implementation across five domains of the SET, (i.e., expectations are defined, expectations are acknowledged, system for responding to behavior, making data-based decisions, and management), with deficits in two domains, “behavior expectations are taught,” and “district-level support” domains by Year 3 of the study. The decrease in ODRs after the implementation of PBIS was the most impressive result of this investigation. The investigators noted that during the first year of implementation, a 20% reduction in average daily ODRs was obtained with demonstrated decreases in both minor infractions (e.g., dress code violations) and major infractions (e.g., serious disobedience of authority). The investigators also reported that following the implementation of PBIS, a decrease in the number of students having multiple discipline referrals was demonstrated. Multiple discipline referrals decreased from 32% of students in Year 2 to 25% of students in Year 3 having two to five discipline referrals and 21% of students in Year 2 to 16% of students in Year 3 having six or more discipline referrals. Since the first year was designated to the planning of PBIS implementation and data collection, ODRs were not collected during that year. One limitation of this investigation is that the authors employed an AB simple phase change design makes causal conclusions impossible.

Netzel and Eber (2003), Scott and Barrett (2004), and Bohanon et al. (2006) provide a description of the potential benefits of implementation of school-wide PBIS. However, these studies differ in their reinforcement procedures, which alter the “worth” of the ticket provided. For example, since the school that Netzel and Eber evaluated awarded students with a lottery, the tickets that students received signified the *chance* to

attain reinforcement. However, the ticket provided to students in the school that Scott and Barrett evaluated signified the *guarantee* to attain reinforcement. Finally, the school evaluated by Bohanon et al. utilized a ticket that served two roles. It could immediately be redeemed to attain an edible, thus having a *worth*, and it also provided students with the *chance* to attain donated items on a weekly basis. Further investigations of the effectiveness of different PBIS reinforcement systems are warranted. The following section evaluates different studies in which the PBIS reinforcement system utilized either tickets that were redeemed at a store allowing one ticket to signal the *guarantee* to attain some type of reinforcement or tickets that were entered into a lottery allowing one ticket to signify the *chance* to obtain a reward.

PBIS Token Reinforcement Utilizing a Store

There is a substantial body of literature on the implementation of token economies (Ayllon & Azrin, 1965; Boren & Colman, 1970; Crawford et al., 1982; Filcheck et al., 2004; Kazdin, 1977; McLaughlin & Malaby, 1972, 1975a, 1975b, 1976; Meichenbaum et al., 1968). The earliest documentation of the use of a token economy in a school dates back to Joseph Lancaster's (1778-1838) Monitorial System in England (Kazdin, 1977). In addition, McLaughlin and Malaby (1972) demonstrated the utility of rewarding students for demonstrating appropriate behavior by comparing the effectiveness of a point exchange system (i.e., students were provided the opportunity to exchange earned points for rewards) in a fifth- and sixth-grade classroom over the course of a year. The authors demonstrated that a variable schedule of point exchange days (i.e., informing students that they would be allowed to exchange earned points for rewards at some time between three to seven days) was more effective at producing less variable and higher

percentages of assignment completion across four academic subjects (i.e., spelling, language, handwriting, and math) compared to a fixed schedule of point exchange days. The dependent variable, assignment completion, was defined as the completion of all tasks assigned by the teacher by the time of the point exchange.

A token economy reinforcement system that utilizes a store similar to McLaughlin and Malaby's (1972) store has been utilized in investigations in the PBIS literature (Bohanon et al., 2006; George et al., 2007; Taylor-Greene & Kartub, 2000). However, the methodologies of the store token reinforcement system in the later studies are not provided to the reader (i.e., the authors' only mention that a store was employed). Identifying the critical procedures in successfully rewarding students for engaging in appropriate behavior through the use of a store with tickets holding a value to students or individuals is not a new one. As a matter of fact, the idea of a generalized conditioned reinforcer dates back to the early 1800s (Kazdin, 1977).

Kazdin and Bootzin (1972) described generalized conditioned reinforcers as stimuli that are interchangeable for a variety of backup reinforcers. Advantages associated with the use of token reinforcers include (a) bridging the gap between demonstrating a target response and receiving reinforcement for that response; (b) allowing individuals to reinforce responses at any given time; (c) maintaining responses over extended periods of time when the backup reinforcer is not readily attainable; (d) allowing sequences of responses to be reinforced without interrupting the sequence itself; (f) attaining relative independence of the effects of satiation; (g) providing the same reinforcement for individuals with different preferences in backup reinforcers; and (h)

having the possibility of attaining greater incentive value than the backup reinforcer since the same conditioned reinforcer can be used for different backup reinforcers.

Additionally, there are a variety of benefits associated with tangible conditioned reinforcers or token reinforcers (Ayllon & Azrin, 1968). Advantages described by Ayllon and Azrin included (a) a quantitative relationship can be established for the amount of tokens to the amount of reinforcement attained, (b) the portable nature of tokens allows the individual to possess the reinforcer far away in time and space from when the reinforcer was initially earned, (c) no ceiling effect regarding the number of tokens an individual can attain is present, (d) tokens' physical appearance can be standardized quite easily, and (e) tokens are presented to the individual by the teacher, thereby, facilitating social reinforcement and pairing the teacher with a generalized reinforcer as well.

Kazdin and Bootzin (1972) describe a variety of strategies future researchers can utilize to increase response and stimulus generalizability of conditioned reinforcers. Stimulus generalization is described as "the transfer of effects to other stimulus conditions or situations" (p. 359). Some of these strategies include teaching only behaviors that will be reinforced in the future after the implementation of the token economy, increasing the reinforcement value of verbal praise by pairing verbal praise with the presentation of the token, gradually removing the token reinforcement schedule, and using stepwise or leveled token systems (i.e., the first level offers less preferred reinforcers that require the least amount of tokens, the next level requires more tokens than the first level, but offers more preferred reinforcers).

Undoubtedly the use of tokens as conditioned reinforcers seems to be extremely

powerful and useful in the procedures used to reward students for engaging in both appropriate academic and social behavior (George et al., 2007; McLaughlin & Malaby, 1972; Miller, George, & Fogt, 2005). However, there is a paucity of research delineating the procedures for successful implementation of a token economy system used to reinforce students for PBIS rules and expectations. Future research is warranted in the area of use of a token economy in which tickets are exchanged for the demonstration of appropriate behavior.

PBIS Token Reinforcement Utilizing a Lottery

Similar to research describing the use of a token economy store, the majority of the research describing the use of a token economy with a lottery does not detail the procedures of the lottery (i.e., how many tickets were pulled for each lottery or how often the lottery occurred), but rather mentions that a lottery was utilized (Luiselli, Putnam, & Sunderland, 2002; Sprague et al., 2001). However, two investigations that did provide details of the lottery implementation are provided by Menendez et al. (2008) and Menousek (2010).

Menendez et al. (2008) attempted to outline the processes, procedures, and outcomes associated with a systematic school-wide PBIS program after one year of PBIS implementation in an elementary school. During the first year of PBIS implementation, the elementary school represented mainly Caucasian and Hispanic students (i.e., 77.5% and 19.6%, respectively). The PBIS procedures and processes were implemented by 3 administrators, 44 teachers, and 14 teacher assistants. The authors conducted inservice trainings with administrators, teachers, and teacher assistants. During a half-day retreat, prior to the implementation of PBIS, 80% of the staff that attended the retreat approved

the plan. Planning teams represented a variety of school staff throughout the school district. The planning team developed the acronym, CHIPS, which stood for “Committee for Helping Implement the Positive-Schoolwide” as a name for their committee. Prior to the implementation year of PBIS, CHIPS refined their systematic plan for teaching expected behaviors of students and for reinforcing students for demonstrating expected behaviors. Menendez et al. noted that the diversity of CHIPS committee members was extremely beneficial to the success of PBIS implementation since members served as informational liaisons in the different school settings, although it is important to note that this is anecdotal information.

CHIPS held an all-staff training in which the systematic reinforcement system and the teaching of expectations were introduced to the school staff (Menendez et al., 2008). During this training, CHIPS selected a lottery system to reinforce students across settings (Jenson, Rhode, & Reavis, 1997; Menendez et al., 2008). The authors chose to reinforce students’ engagement in appropriate behavior with “Busy Bee” tickets (Menendez et al., 2008). After receiving a ticket, students were instructed to write their name on the back of the ticket and then place the ticket in the “hive,” or lottery box in each classroom. Students’ names were drawn from the hive twice a day, once before lunch and once in the afternoon. The authors did not specify how many names were drawn during each occurrence of the lottery. Students whose names were selected were sent to the office to sign the Behavioral Bingo board (Jenson et al., 2008) which was located in the main hallway outside of the office. When students pulled numbers for the Behavioral Bingo in the office, they were provided with verbal praise from the administration. As rows were filled, all students who were in the completed row (i.e., a vertical, horizontal, or diagonal

row on the Bingo card) were given a Mystery Motivator (Jenson et al., 2008). In addition, weekly school assemblies were held to provide direct instruction of behavioral expectations and to recognize students that consistently met behavioral expectations (Menendez et al., 2008).

Menendez et al. (2008) used ODRs as the primary dependent measure to assess the effectiveness of PBIS implementation. Results indicated that the number of ODRs during the PBIS implementation year for 8 of the 10 school months was lower than that of the previous year (i.e., reductions per month ranged from 2-48.3%). During the two months in which ODRs were higher, the differences ranged from an increase in 1.4% in May to 34.2% in September. Overall, during the implementation of the initial year of PBIS, there were 130 fewer ODRs compared to the baseline year. In addition, the implementation of PBIS had the highest effect on students prone to receive the least amount of ODRs (i.e., students with one to four referrals per year; Sugai et al., 2000) which is demonstrated by a 36.6% decrease in ODRs for this group. Students with 10 or more ODRs in a year demonstrated an 18.8% decrease, and students with 5 to 9 ODRs demonstrated a 20% increase in ODRs following PBIS implementation. The reason for the demonstrated increase in ODRs in the 5 to 9 ODR group was not addressed by the authors. However, the increase in percentage of students in the 5 to 9 group may be attributed to the decrease of students included in the 10 or more group (i.e., those students moving to the 5 to 9 ODR group).

Overall, the implementation of PBIS resulted in decreases in ODRs across the entire school. The school chose to reinforce students using a combination of Lottery, Behavioral Bingo, and Mystery Motivator interventions. In this study, a ticket signified

the *chance* to attain a delayed reinforcer (Menendez et al., 2008). However, since students were provided with the chance to attain delayed reinforcer 14 times a week, the schedule may have been rich enough to maintain appropriate behavior (Kazdin & Bootzin, 1972; Kelleher & Gollub, 1962). Future research should address the effectiveness of different system-wide reinforcement systems used within PBIS. Limitations of the study included the use of an A/B design which limits the ability to make causal statements.

Menousek (2010) sought to evaluate the effect of the class-wide component of PBIS utilizing a token reinforcement with a lottery on students' Appropriately Engaged Behavior (AEB). More specifically, the additive effects of three of the classroom components of PBIS at increasing appropriate behavior were assessed (i.e., the direct teaching and review of PBIS classroom expectations and rules, presentation of tickets with verbal praise, and lottery). The primary dependent measure was AEB and was defined as "the student directing attention towards the currently assigned activity or the student being engaged in the currently assigned activity" (p. 38).

The study included three elementary classrooms in south Mississippi (i.e., second-, third-, and fourth-grade classrooms; Menousek, 2010). Treatment effects for each classroom were assessed using a multiple baseline comparison. Mean percentage of observed intervals of AEB across phases (baseline; direct teaching and review of PBIS classroom expectations and rules; direct teaching and review of PBIS classroom expectations and rules with token presentation combined with verbal praise (T/P); direct teaching and review of PBIS classroom expectations and rules, with T/P and a weekly lottery; and follow-up) were compared. The direct teaching and review of PBIS

classroom expectations and rules involved reviewing classroom expectations and rules developed through consultation. PBIS expectations and rules remained consistent with the school's PBIS expectations (e.g., "be safe," "be responsible," "be respectable"); and were positively stated (e.g., "Follow instructions the first time they are given"; Cohen et al., 2007; Horner et al., 2004; Kincaid et al., 2005). The direct teaching and review of PBIS classroom expectations and rules with T/P included presenting students with a T/P specific to the student's AEB. In addition to reviewing the rules, teachers were instructed to provide at least one student per row or group of students that was exhibiting AEB with a T/P at least once every 5 min during the 20-min observation period. During this phase, the tickets did not signal the chance to attain a reward (Menousek, 2010).

During the third phase of the intervention (i.e., the direct teaching and review of PBIS classroom expectations and rules with T/P and a weekly lottery), teachers were instructed to collect all the tickets previously won during the direct teaching and review of PBIS classroom expectations and rules with T/P phase. Rewards selected for the lottery were deemed developmentally appropriate privileges or tangibles chosen during consultation between the author and the classroom teacher (e.g., pencils, being the group monitor, 10 min of computer time, stickers). During this phase, students were instructed to write their names on the back of the ticket and place their tickets into a lottery box that was held every Friday, or the last day of the school week, after lunch. Three follow-up observations were conducted in all three classrooms two, three, and four weeks after the last observation of the direct teaching and review of PBIS classroom expectations and rules with T/P and a weekly lottery (Menousek, 2010).

During baseline observations, the mean levels of AEB were 35%, 40%, and 18% in the fourth, third, and second grade classroom respectively. Mean levels of AEB were 49%, 40%, and 35% in the fourth, third, and second grade classrooms, respectively, after the introduction of the direct teaching and review of the PBIS classroom expectations and rules phase. With the implementation of the direct teaching and review of PBIS classroom expectations and rules phase with T/P, mean levels of AEB increased to 52%, 47%, and 56% in the fourth, third, and second grade classrooms, respectively. Interestingly, the implementation of the direct teaching and review of PBIS classroom expectation and rules with T/P and a weekly lottery phase demonstrated marginal gains in mean levels of AEB in two of the classrooms (i.e., 3% and 7%, in the fourth and third grade classrooms, respectively) and a decrease in the second grade classroom (i.e., 2%). Although increases were minor, students' mean engagement in AEB was still high in comparison to baseline. During follow-up observations, mean levels of AEB were 45%, 54%, and 47% in the fourth, third, and second grade classrooms, respectively. Through visual analysis of the data, it was evident that the addition of a lottery increased the percentage of AEB minimally for two classrooms and actually increased the percentage of AEB in one of the classrooms. Further research should investigate PBIS reinforcement systems used at both the school and classroom level (Menousek, 2010).

Summary of PBIS Literature

PBIS procedures have proven to be successful at decreasing disruptive behavior in the classroom (Kincaid et al., 2002; Luiselli et al., 2002; McCurdy, Mannella, & Eldridge, 2003; Menousek, 2010; Metzler et al., 2001; Netzel & Eber, 2003; Scott & Barrett, 2004; Sugai & Horner, 2008; Sugai et al., 2000) and in different school settings

(Bohanon et al., 2006; Carr et al., 2002; Netzel & Eber, 2003; Scott & Barrett, 2004).

Many of these studies, however, are limited in that the methodology of the study was not clearly defined, and non-experimental designs were used, thereby limiting the ability to make causal statements (Bohanon et al., 2006; Carr et al., 2002; George et al., 2007; Kartub, Taylor-Greene, March & Horner., 2000; Menendez et al., 2008; Netzel & Eber, 2003; Scott & Barrett, 2004; Taylor-Greene & Kartub, 2000). In addition, some researchers used subjective staff report to demonstrate the effectiveness of PBIS implementation in decreasing discipline referrals (Netzel & Eber, 2003). Since these findings were based on anecdotal information, causation cannot be inferred. Finally, Scott and Barrett (2004) demonstrated that PBIS procedures can serve to not only decrease ODRs and school suspensions, but also save money. However, information obtained from this study was also achieved through the use of a non-experimental design. Although there is a wide range of literature discussing the impact of PBIS on a school-wide level, little research focused on the impact of PBIS in the classroom. In addition, there is a limited amount of research that utilizes outcome measures that focus on increases in appropriate behavior as indicators of the effectiveness of PBIS.

The establishment of a reinforcement system during the planning of PBIS is one of the identifying criteria of PBIS (Cohen et al., 2007; Horner et al., 2004; Kincaid et al., 2005). Throughout the PBIS literature, the most typical types of reinforcement systems either employ a lottery, a store, or a combination of both. Menousek (2010) assessed the effectiveness of the additive effects of PBIS procedures at the classroom level and indicated that the effectiveness of the implementation of the direct teaching and review of PBIS classroom expectations and rules with T/P and a lottery did not substantially

increase mean levels of students' AEB compared to the direct teaching and review of PBIS classroom with T/P. Kazdin and Bootzin (1972) described a conditioned reinforcer (e.g., a ticket or a token) as being interchangeable for a variety of backup reinforcers. Taking this into account, it was hypothesized that tokens that could be exchanged for backup reinforcers (i.e. guarantees of access to reinforcers) would be more effective at increasing students' AEB compared to tokens that only provided the *chance* to attain a backup reinforcer.

Purpose of the Present Study

The purpose of the present study was to compare the effectiveness of two token reinforcement systems typically used in PBIS in increasing AEB in the classroom. Specifically, the current investigation compares the effects of a lottery and a store on AEB. It was hypothesized that the percentage of AEB would be higher during the store phase since direct reinforcement is more effective than social reinforcement, the schedule of reinforcement is thicker during the store phase, and students are guaranteed a reward during the store phase whereas they are only provided with a chance to attain a reward during the lottery phase.

Research Question

The following research question is offered:

Which intervention, a PBIS lottery or a PBIS store, is more effective at increasing students' AEB when included as part of a PBIS classroom system?

CHAPTER II

METHOD

Participants

The investigation was conducted in one first-, two second-, and one third-grade general education classrooms from a participating elementary school in south Mississippi. This study was approved by the University of Southern Mississippi Institutional Review Board (see Appendix A). All four participating classroom teachers' self-referred for behavior management problems. The first grade teacher, Ms. Eleanor, was a Caucasian female with thirty years teaching experience and a Bachelor's degree in education. The second-grade teachers included Ms. Penny and Ms. Molly Jo. Ms. Penny was an African American female with a Bachelor's degree in education and twenty-two years of experience. Ms. Molly Jo was an African American female with a Master's degree in education and ten years of experience. Finally, the third-grade teacher, Ms. Lucy, was a Caucasian female with four years of experience and a Bachelor's degree in Education.

Informed consent to participate in the current investigation was obtained from each teacher (see Appendix B). In order to participate in the current investigation, appropriately engaged behavior (AEB) could not occur in more than 50% of the observed intervals in a 20-min classroom screening observation (see Appendix C; Menousek, 2010). The screening observation involved a momentary time sampling observation procedure in which all the students in the classroom were separated into groups of three and each student in each group was observed at the beginning of each 10-s interval and recorded as either engaging or not engaging in appropriate behavior.

At the beginning of the observation, you will observe the first student in each group, beginning at the front left of the classroom and moving back to the back right of the classroom. The screening session also served as baseline data and was conducted to ensure that students in each classroom were not engaging in AEB in more than 50% of observed intervals (see Appendix C for a detailed description of Observation procedures). Baseline/Screening observations were conducted during instruction periods that the classroom teacher identified as the most disruptive during interviews with classroom teachers (i.e., math in Ms. Penny's classroom; and reading in Ms. Molly Jo's, Ms. Eleanor's, and Ms. Lucy's classroom).

Setting

All four classrooms were located at the same school building. The school that participated in the current study was a member of a school district that served 446 students and employed 28 teachers. The school served Kindergarten through sixth grade students. The racial makeup of the school was 98.2% Black, 0.9% White and 0.9% Hispanic. Approximately 98% of students received free and/or reduced lunch. Data were collected in the spring semester for all classrooms except for two of the baseline data points in Ms. Lucy's classroom which were collected in December of the previous fall semester. Sessions took place during reading instruction for Ms. Eleanor's, Ms. Molly Jo's, and Ms. Lucy's class and during math instruction for Ms. Penny's classroom. Classrooms varied in the organization of the desks, placements of teacher's desks, and teaching material posted on the wall. School-wide expectations were posted in the lobby of the school. No other expectations were posted throughout the school. Student's were provided with "bucks" that were

typically provided to students by the administrators and teachers while walking quietly in the hallway. Teacher's typically reported using the "bucks" during transitions in the hallway. The school had a school-wide lottery that occurred at unexpected times throughout the year (i.e., approximately once every three months).

A SET was conducted by the primary investigator prior to the screening observation to obtain the approximate degree that PBIS was implemented at the participating school (Horner et al., 2004). The strongest area of PBIS for the school was in the category regarding monitoring and decision-making (i.e., implementing at 75%). The school's mean SET score indicated that 40.53% of critical PBIS features were being implemented, which does not reach the level of PBIS implementation/maintenance. Figure 3 depicts the SET Scores for the participating elementary school.

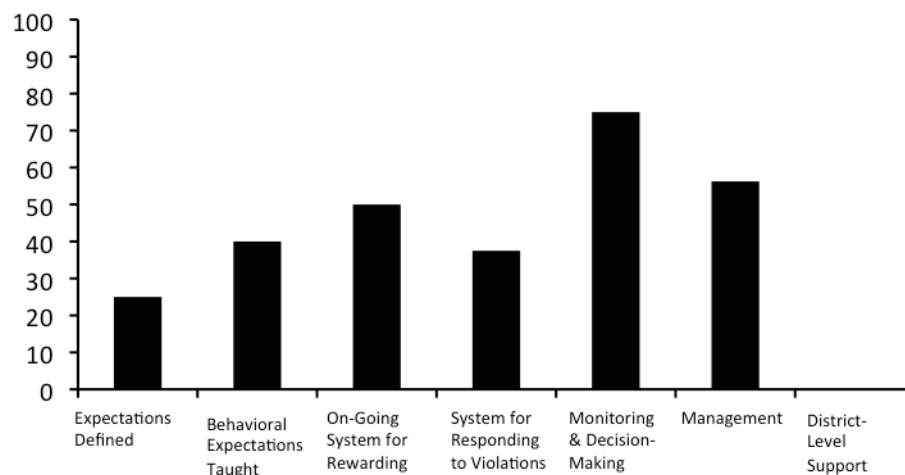


Figure 3. SET Scores for the Participating Elementary School.

Dependent Measure

For the purpose of this investigation, the primary dependent variable was AEB and was defined as “the student directing attention towards the currently assigned activity or the student being engaged in the currently assigned activity” (Menousek, 2010, p. 35). AEB was chosen as the primary dependent measure based on the assumption that the amount of time that students are engaged with learning material is predictive of future achievement (Grimm, Steele, Mashburn, Burchinal, & Pianta, 2010).

Prior to the implementation of either intervention (i.e., the store or lottery) each participating teacher was asked to complete the American School Climate Survey-Teacher Version as a measure of social validity (Perkins, 2006). The American School Climate Survey was taken from the Center for the Study of School Climate. The survey includes 25 questions designed to gather perspectives of teachers of grades 4-12 in regards to their perspectives on school learning climate, bullying, and perceptions on race. According to the author's, the American School Climate survey has been used in a study of over 40,000 students, approximately 4,000 teachers, and approximately 300 administrators. No validity or reliability measures were reported for this measure. The survey was administered immediately prior to the implementation of either phase and immediately after the implementation of the final phase in each classroom.

Materials

Teachers were provided with a lottery box or container (e.g., a box with a slit in the box to insert tickets). Tickets (see Appendix D) were deposited into the lottery box by the students. The design of the tickets as well as the ticket procedures did not vary across classrooms since all four classrooms were from the same school with the same

PBIS expectations. The creation of tickets was based on the primary investigator's consultation with the teacher. Tickets created were those identified by the teacher and primary investigator as developmentally appropriate. However, each ticket included a space to provide the name of the student to whom the ticket is presented. During the store token reinforcement system phase, ticket design and procedures were identical to that of the tickets used in the lottery phase, with the exception of how the tickets were redeemed (see Procedures section).

Design

A nonconcurrent multiple baseline comparing A (baseline), B (lottery phase), and C (store phase) and controlling for order was utilized across four classrooms to assess the treatment effects for each classroom (Kazdin, 1982, 1984). The order of intervention phases was counterbalanced, so that the order of intervention phases for the first and second classroom was ABC and the third and fourth classroom was presented with intervention phases in the opposite fashion (i.e., ACB). The design allowed for within-series comparisons across each of the classrooms' mean percentage of observed intervals of AEB across phases (baseline; lottery phase, and store phase). In addition, between-series comparisons across each classroom's mean percentage of observed intervals of AEB are available, because intervention phases were counterbalanced. Baseline observations were conducted concurrently for each participating classroom with the exception of two data points in Ms. Lucy's classroom that were collected prior to the winter break. However, the third datum collected in baseline in Ms. Lucy's class was collected concurrently with baseline observations in all four classrooms (i.e., after winter vacation). The phase change of each of intervention was staggered and changed when a

clear and stable or decreasing trend was established. All four classrooms followed this design until the lottery phase and store phase were completed once in all four participating classrooms.

Procedures

All four teachers were asked to provide informed consent (see Appendix B), to acknowledge their understanding of the goals, risks, and benefits of their individual and their classrooms' participation in the current investigation after they met inclusion criteria (i.e., their students engaged in no more than 50% AEB during baseline observations; Menousek, 2010). In addition, informed consent was not obtained until after baseline observation had been conducted, to protect the teacher from altering her behavior after being informed as to the purpose of the study. Procedures for the current investigation were based in part on Menousek (2010). None of the teachers in the study were implementing a class-wide system prior to the beginning of the study. Prior to the collection of baseline data, the primary investigator consulted with each teacher to address the teacher's concerns regarding classroom management, along with a brief review of previous interventions attempted by the teacher. In advance of discussing the individual treatment conditions, it should be noted that treatment integrity and interobserver agreement (IOA) will be discussed in detail for each phase in the procedures designated sections.

Baseline

During baseline, no experimental procedures were in effect in order to assess initial levels of student behavior. At least three observations were obtained prior to the implementation of experimental procedures for each classroom in an attempt to establish

level, trend, and variability around level and trend. A 10-s momentary time sampling observation procedure was used to gather AEB data (see Appendix C). Data collection began after the initial screening session had been completed, and the classroom had met inclusion criteria for participation in the current investigation. Data from the initial screening session were then used as the first data point in the baseline condition. After a stable or decreasing baseline had been established for each classroom, teacher consent to participate in the current investigation for each of the four classrooms was obtained prior to the introduction of either intervention (i.e., store or lottery). Once an appropriate pattern emerged, the teacher was told that she would be trained in proactive PBIS classroom management techniques. The teacher was also informed that data would be gathered throughout the project relative to the objectives of the study. In an attempt to ensure that the teachers were not implementing procedures similar to those of the current investigation, treatment integrity (Barlow & Hersen, 1984; Gresham, 1989) was assessed for at least 33% of the observations in this phase (range 33-66%). Treatment integrity was calculated as a percentage by dividing the number of components completed per day by the number of possible components and multiplying the total by 100. Interobserver agreement (IOA) was assessed for at least 33% of observations in this phase (range = 33-66%).

Although it was not expected to occur at high frequencies or to occur at all during baseline, T/P and teacher verbal praise were recorded using a frequency recording within intervals method throughout the 20-min observation period since T/P and verbal praise alone are observable behaviors, discrete, and were expected to be occurring at low frequencies (Hayes, Barlow, & Nelson-Gray, 1999). The reason these variables were

measures was because teacher verbal praise and T/P were the critical components of PBIS interventions (i.e., if teacher's did not provide students with praise or T/P then the independent variables would not be salient to students). The number of observed instances of T/P or verbal praise were totaled for the 20-min observation session and then divided by the total number of minutes of the observation to obtain a mean rate of T/P and a mean rate of verbal praise across phases per 20-min observation. In addition, token presentation combined with verbal praise (T/P) served as an independent measure. T/P was defined as "teachers presenting students with a ticket contingent on students' adherence to any of the classroom rules combined with teacher verbal praise (e.g., "I like the way that you picked up your materials after you were through with them!" or "I like the way you are sitting at your desk reading!") contingent on students' AEB" (Menousek, 2010, p. 40). Teacher verbal praise could be either a general praise statement not specific to students' behavior (e.g., "Outstanding!" or "Cool Breeze!") or specific verbal praise statement explicit to students' behavior (e.g., "I love it how you are starting the assignment just like I asked you!" or "Thank you for waiting until you were called on to speak!"). Teacher verbal praise was only recorded as occurring if it was not combined with a ticket presentation.

PBIS Consultative Procedures

Although the manipulation of token reinforcement systems was of primary concern of this study, the primary investigator consulted with participating teachers to ensure that PBIS procedures were being properly implemented in the classroom. Teachers were trained by the primary investigator in the implementation of the classroom component of PBIS. These procedures included the direct teaching and review of PBIS classroom

expectations and rules; and ticket presentation combined with teacher verbal praise (T/P). Both the direct teaching and review of PBIS classroom expectations and rules combined with T/P were present throughout both phases of the current investigation (i.e., lottery phase and store phase), with the exception of the baseline phase.

Direct Teaching and Review of PBIS Classroom Expectations and Rules

Rules were created through consultation procedures based on teachers' concerns for their classrooms. All rules were consistent with the school's PBIS expectations (e.g., "Be Responsible" "Be Respectable" "Be Safe") and were positively stated (e.g., "Keep your hands and feet to yourself"; see Appendix E; Cohen et al., 2007; Horner et al., 2004; Kincaid et al., 2005). The direct teaching and review of PBIS classroom expectations and rules were taught using a written protocol (see Appendix F). Teachers were instructed to read the protocol silently. Lastly, a behavioral role modeling session was conducted by the investigator (see Appendix G). Three to five rules were created during consultation between the teacher and the primary investigator (Carr et al, 2002).

After the rules were established, the primary investigator wrote the classrooms rules on a poster and presented it to the teacher to be displayed in the classroom. Teachers were instructed to read aloud each PBIS classroom rule to the students once a day prior to the observed instructional period identified by the teacher as the most disruptive. Teachers were instructed to review the classroom expectations and rules according to the instructions provided in Appendix F.

Independent Measures

Direct Teaching and Review of PBIS Classroom Expectations and Rules with T/P

Additionally, teachers were instructed to provide students with a T/P specific to the student's AEB (see Appendix H). All four teachers were trained in T/P procedures in the same manner as the direct teaching and review of PBIS classroom expectations and rules procedures were taught (see Appendix G). Each teacher was requested to provide at least one student per row or group that was following a classroom rule with a T/P at least once every 5-min. After a teacher had provided a T/P to a student to the first group or row of children, she was instructed to present a T/P to a student from a different row or group during the following 5-min period and told to move to each row or group of students for each five-min period thereafter. If there were not any students engaging in appropriate behavior in a particular row or group for a 5-min period, the teacher was instructed to move to the next row. Teachers were instructed to make each T/P specific to the AEB demonstrated by the student (e.g., "Betty, I like the way you waited for the teacher to call on you before you talked."). No specific instructions were given to teachers as to how to respond to inappropriate behaviors. The direct teaching and review of PBIS classroom expectations and rules and T/P procedures were implemented following baseline. Teachers were instructed by the primary investigator to continue implementing these procedures for the remainder of the investigation.

Lottery Phase

During the lottery phase, the direct teaching and review of PBIS classroom rules and expectations with T/P were implemented. Prior to the implementation of the lottery phase procedures, students were informed that they would be receiving tickets for

demonstrating AEB and rule following behavior. In addition, students were informed that the tickets would be placed in a weekly lottery. All tickets presented to students were placed in a lottery box or container that was provided to the teacher by the primary investigator. Once a student had been provided with a T/P, the student wrote his or her name on the ticket. Every Friday (or the last day of the school week) after lunch, students were instructed to place all of their tickets into the lottery box, and a weekly lottery drawing was conducted. During the lottery drawing, the teacher pulled out four tickets from the lottery box (Menousek, 2010). Lottery procedures are described in detail in Appendix I. Students whose names were pulled from the lottery box were allowed to pick from a variety of tangible items or privileges that were previously selected by the teacher, the students, and the primary investigator (Appendix J).

During the selection of the rewards, the teacher and the primary investigator discussed developmentally appropriate privileges for which they believed the students would be encouraged to work for (e.g., stickers, pencils, being the teacher's helper, 10-min of extra free time, see Appendixes J and K). The teacher then discussed the list with the students, and the class voted on which rewards they would like to be added to the drawing. Once a student's name was pulled during the weekly lottery, he or she was not able to attain two prizes. If this did occur, the student's second pulled ticket was set to the side of the box, and another ticket was pulled. After the weekly lottery, all tickets were removed from the lottery box. Classrooms remained in the lottery phase for at least two weeks so that they would be able to participate in at least two stores. In addition, each classroom remained in the lottery phase until a stable or decreasing trend was observed to occur. Teachers were trained in lottery conditions in the same manner the

direct teaching and review of PBIS classroom expectations and rules strategy and T/P were taught (see Appendix G).

The teachers were provided with feedback by the primary investigator on the accuracy of their technique in this phase with the use of treatment integrity checks for at least 33% of classroom observations and 100% of observations of the lottery in the lottery phase. Feedback was based on each teacher's adherence to the guidelines provided in Appendix H. Treatment integrity was assessed for at least 33% of observations in this phase (range = 33-85%). During the integrity check, if a teacher did not adhere to one or more of these guidelines at any point during the randomly assigned checks, retraining occurred until the teacher demonstrated 100% integrity during retraining. If a teacher demonstrated further errors after the initial retraining, the primary experimenter would continue to retrain the teacher until the teacher was observed to demonstrate 100% treatment integrity. IOA was assessed for at least 33% of the observations in this phase (range = 37-100%).

Store Phase

During the store phase, the direct teaching and review of PBIS classroom rules and expectations with T/P were implemented. Prior to the implementation of the store phase, students were informed that they would be receiving tickets for demonstrating AEB and rule following behavior. In addition, students were informed that they would have the opportunity to exchange tickets for rewards at the end of the week after lunch. Students were provided the opportunity to redeem their earned tickets at the end of the week for the same reinforcers that were available in the lottery phase. Similar to the lottery phase, upon the occurrence of receiving a ticket, students were instructed to write

his or her name on the ticket. Every Friday (or the last day of the school week) after lunch, students were provided with the opportunity to redeem their previously earned tickets for the same reinforcers that were available in the lottery. See Appendix L for a full description of the store phase procedures.

Rewards were selected in the same fashion as previously discussed in the lottery phase. However, the “costs” of the reinforcers were determined by the classroom vote (see Appendix J). The prices of the rewards were determined based on the classroom’s ranking of rewards during the reward selection procedure. The rewards that cost the most points were those that received the most votes during the reward selection procedure. Rewards that received no votes during the reward selection cost the least (i.e., one ticket). The remaining rewards were rank ordered based on the classroom vote, and the number of tickets increased in 5-point increments beginning with the second to last ranked reward (i.e., 0 votes costs one point, the second to last ranked reward costs 5 tickets, the third to last ranked reward costs 10 tickets, the fourth to last ranked reward costs 15 tickets, etc.).

During the ticket exchange period, which occurred every Friday (or the last day of the week) in the afternoon, the teacher indicated that it was time to redeem tickets. The teacher called upon students in groups of five to redeem their tickets (see Appendix L), and students had no more than 2 min to choose their reward. During this time, students were also provided the option of saving their tickets if they did not have enough to purchase the reward that they wished to purchase. Although teachers were instructed that they could make adjustments to the prices of rewards as the demands dictated and to avoid students hoarding tickets (Jenson et al., 1997), this never occurred. Classrooms remained in the store phase for at least two weeks so that they would be able to

participate in at least two stores. In addition, each classroom remained in the store phase until a stable or decreasing trend in AEB was observed to occur. Teachers were trained in the store phase in the same manner the direct teaching and review of PBIS classroom expectations and rules strategy and T/P were taught (see Appendix G).

The teachers were provided with feedback by the primary investigator on the accuracy of their technique in this phase with the use of treatment integrity checks for at least 33% of classroom observations and 100% of observations of the store in the store phase. Feedback was based on each teacher's adherence to the guidelines provided in Appendixes F, H, I, and L. Treatment integrity was assessed for at least 50% of observations in this phase (range = 50-80%). During the integrity check, if a teacher did not adhere to one or more of these guidelines at any point during the randomly assigned checks, retraining occurred until the teacher demonstrated 100% integrity during retraining. If additional errors in implementation occurred after teachers were retrained, teachers would be provided with further training until they demonstrated 100% integrity during the next integrity check. IOA was assessed for at least 33% of the observations in this phase (range = 40-75%).

Reliability and Treatment Integrity

Interobserver Agreement

IOA was assessed for at least 33% of observations in each classroom for all phases. IOA observations were evenly distributed across phases. Secondary observers were trained in the observation and recording of AEBs, T/Ps, and teacher verbal praise prior to the collection of baseline data. Training involved the primary investigator explaining the observation procedures to the secondary observers. The primary

investigator re-trained the observer when IOA fell below 80% (i.e., 63% and 74%).

Agreements between observers for teacher behaviors and student behaviors were defined as intervals in which both observers coded the same adult or student behavior within each interval. Agreements between observers for AEB, T/P, and/or teacher verbal praise were defined as intervals in which both observers agreed on AEB, T/P, and/or teacher verbal praise as occurring or not occurring in that interval. To calculate a percentage of agreements between the observers, the total number of interobserver agreements were divided by the number of agreements plus disagreements and multiplied by 100. The agreements of the observers on the observed intervals of AEB, T/P, and teacher verbal praise were then divided by the number of agreements plus disagreements and multiplied by 100 to calculate a percentage.

IOA was collected for 46.43% of the observed sessions. Overall, IOA averaged 94% across all of the measured variables. Individual variables and their mean percentages obtained included: (a) 90% for AEB (range = 63-100%), (b) 99% for TP (range = 96-100%), and (c) 94% for Verbal Praise (range = 88-100%).

Interrater reliability observations involved both the primary and secondary observer. Observers were connected to a split wire audio device. An audio recording cued the beginning of each 10-s observation interval. After the beep, both observers momentarily observed a previously indicated student to assess whether that particular student was engaged in appropriate behavior. The observers also monitored the number of occurrences or nonoccurrence of teacher's T/P and verbal praise throughout the 20-min observation. The observers then had the remainder of the 10-s observation interval

to record the number of observed T/P, teacher verbal praise, and the occurrence or nonoccurrence of AEB of for that particular student (see Appendix C).

Treatment Integrity

Treatment integrity (Barlow & Hersen, 1984; Gresham, 1989) was assessed for at least 33% of the observations for each phase of the investigation as well as during baseline and was evenly distributed across all phases. IOA was assessed during at least 33% of the treatment integrity checks for each phase. During the three phases of the investigation, the primary investigator recorded whether each teacher had appropriately followed the guidelines while administering the direct teaching and review of PBIS classroom expectations and rules and T/P (see Appendixes F, H, I, and L). Treatment integrity was assessed for 100% of all lottery and store procedures. Percent treatment integrity was computed for all phases by dividing the number of appropriate teacher responses checked by the observer by the total number of expected teacher responses, and multiplying the resulting value by 100. If any of the guidelines were not met during all intervention phases, the primary investigator provided feedback to the teacher by identifying which guidelines were not met and what modifications needed to be met to follow guidelines accurately. If 100% treatment integrity was not achieved during any of the observations with the exception of those observations in the baseline, the observation was noted, and the primary investigator provided that teacher with further consultation until 100% integrity was reached. Table 1 depicts the mean baseline and intervention treatment integrity percentages for each classroom across phases.

IOA was assessed during 64% of the treatment integrity checks for all lottery and store procedures. Overall, IOA averaged 99% across all of the treatment integrity

variables. Mean percentages of treatment integrity IOA across each phase included: (a) 100% for baseline, (b) 98.9% for the store phase (range = 85.7-100%), and (c) 98.4% for the lottery phase (range = 85.7-100%).

Data Analysis

Visual Analysis

Each classroom's percentage of AEB and teacher's rate of T/P across baseline and experimental conditions was graphed and visually inspected (Kazdin, 1982, 1984).

Within-classroom analyses were conducted for each of the four classrooms in the study to evaluate the effectiveness of each class-wide condition on increasing students' AEB and teacher's T/P. In addition, between series comparisons were conducted across the four classrooms in the study as an additional evaluation of the effectiveness of the two interventions on increasing students' AEB and teacher's T/P.

Table 1

Mean Baseline and Intervention Treatment Integrity Percentages across Phases

Classroom	Phase		
	Baseline	Lottery Phase	Store Phase
Ms. Lucy	--	89	86
Ms. Molly Jo	--	100	86
Ms. Eleanor	--	86	81
Ms. Penny	--	93	96

Statistical Analysis

Multilevel modeling was utilized to calculate average intervention effects and determine their statistical significance (Ferron, Bell, Hess, Rendina-Gobioff, & Hibbard, 2009; Van den Noortgate & Onghena, 2003). Multilevel modeling can be used when data

are hierarchically structured (i.e., scores at points in time are nested within individuals or groups; Van den Noortgate & Onghena, 2003). The analyses are dependent of each other due to the repeated observations within classes. Because students' scores are not independent, the rules of many statistical procedures are violated. Through the use of multilevel modeling, heterogeneity in intervention effects across cases as well as the serial dependence of scores within cases can be appropriately addressed, thereby permitting statistical inference (i.e., how much scores taken at a later period can be predicted by the score that occurs immediately before it). Estimates of fixed-effects (i.e., average intervention effects) and covariance parameters (i.e., variability in intervention effects, first order autocorrelation, and residual variance) were calculated.

Clinical Outcome Indices

In addition to the visual and statistical analyses of the data, data were also analyzed to demonstrate the level of impact of the results using methodology based on Parker and Hagan-Burke (2007). Parker and Hagan-Burke (2007) define improvement as “change beyond the level of the baseline phase” (p. 640). Calculating the odds of improvement during the intervention phase was completed by dividing the total number of intervention data points that do not overlap with baseline data over the number of points that do overlap with baseline data. Calculating the baseline odds of improvement was completed by dividing the number of baseline points that do overlap with intervention data with the number of data points that do not overlap. The odds ratio divides the odds of improvement during intervention (i.e., direct teaching of the PBIS classroom expectations and rules, direct teaching of the PBIS classroom expectations and rules with TP, direct teaching of the PBIS classroom expectations and rules with TP and

Lottery, and Follow-up) by the odds of improvement in baseline, indicating how likely improvement is during intervention as compared to baseline. Odds ratios of improvement are reported across all three classrooms and for each individual classroom.

CHAPTER III

RESULTS

Visual Analysis and Descriptive Statistics

Figure 4 shows AEB percentages for the four classrooms across conditions. During baseline, mean AEB was 44% and 39% in Ms. Lucy's and Ms. Molly Jo's classrooms, respectively. After the introduction of the lottery phase, mean AEB was 58% and 59%, respectively. The mean AEB was 59% and 69% after the implementation of the store phase in Ms. Lucy's and Ms. Molly Jo's classrooms, respectively. The mean AEB during baseline was 44% and 43% in Ms. Eleanor's and Ms. Penny's classroom, respectively. After the introduction of the store phase, mean AEB was 62% and 64%, respectively. Finally, with the introduction of the lottery phase, mean AEB was 58% and 68% in Ms. Eleanor's and Ms. Penny's classroom, respectively.

For all four classrooms, there was a substantial increase of AEB between baseline and the introduction of the combined components of PBIS consultative procedures and intervention. For two classrooms the mean level of percentage of AEB was marginally greater in the lottery phase and for the other two classrooms, the mean level of percentage of AEB was marginally greater in the store phase. Table 2 summarizes the means and standard deviations of AEB, TP, and rate of teacher praise for each classroom for each phase of the study Table 2 summarizes the means and standard deviations of AEB, TP, and rate of teacher praise for each classroom for each phase of the study.

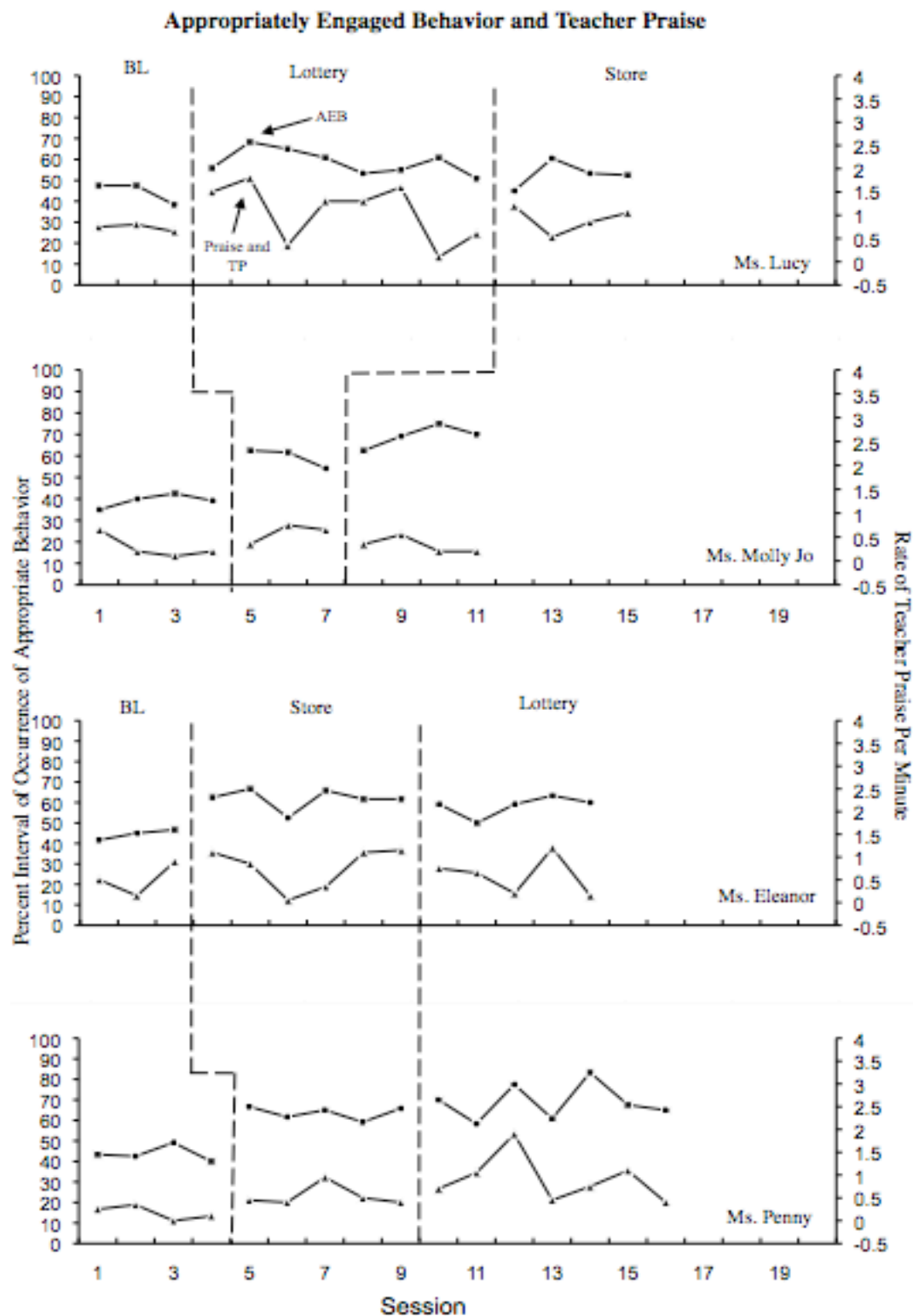


Figure 4. Percent of Intervals of AEB and Rate of Teacher Praise per Minute during 20-min Observation Sessions across Classrooms.

Table 2

Means and Standard Deviations for Percentage of Intervals Appropriately Engaged Behavior (AEB) Occurred, Mean Rate of Ticket Presentation Paired with Verbal Praise (TP), and Mean Rate of Verbal Praise

Classroom	Measure					
	AEB		TP		Praise	
	M	SD	M	SD	M	SD
Ms. Lucy						
Baseline	44.44	5.29	.00	.00	.73	.07
Lottery	58.75	6.02	.38	.37	.68	.43
Store	52.83	6.34	.21	.20	.69	.32
Ms. Molly Jo						
Baseline	39.16	3.11	.00	.00	.28	.24
Lottery	59.44	4.59	.15	.15	.43	.22
Store	69.04	5.13	.00	.00	.32	.16
Ms. Eleanor						
Baseline	44.44	2.54	.00	.00	.51	.37
Store	61.80	5.03	.52	.39	.24	.16
Lottery	58.33	4.96	.34	.31	.25	.16
Ms. Penny						
Baseline	43.75	3.87	.00	.00	.17	.15
Store	63.92	3.15	.23	.09	.31	.17
Lottery	68.92	8.91	.60	.37	.32	.17

During baseline the mean rate of T/P was 0 per minute for all four classrooms. This was expected to occur since during this phase, the teachers were not instructed to provide students with T/P. After the implementation of the lottery phase in the first two classrooms the mean rate of TP was .38 and .15 for Ms. Lucy's and Ms. Molly Jo's classrooms, respectively. After moving to the store phase, the mean rate of T/P was .21 and 0 for Ms. Lucy's and Ms. Molly Jo's classrooms, respectively. For the other two classrooms, the mean rate of T/P was .17 and .52 after the introduction of the store phase in Ms. Elenor's and Ms. Penny's classrooms, respectively. Finally, following the implementaiton of the lottery phase the mean rate of T/P was .60 and .34 in Ms. Elenor's and Ms. Penny's classrooms, respectively.

Mixed results were demonstrated by the four teachers in mean rate of teacher verbal praise with the introduction of PBIS procedures and either the store or lottery reinforcement system. During baseline the mean rate of teacher verbal praise was .73, .28, .17, and .51 for Ms. Lucy's, Ms. Molly Jo's, Ms. Eleanor's, and Ms. Penny's classrooms, respectively. After the implementation of the lottery phase in the first two classrooms the mean rate of teacher verbal praise decreased from .73 to .68 and increased from .28 to .43 for Ms. Lucy's and Ms. Molly Jo's classrooms, respectively. After moving to the store phase, the mean rate of teacher verbal praise increased from .68 to .69 and decreased from .43 to .32 for Ms. Lucy's and Ms. Molly Jo's classrooms, respectively. For the other two classrooms, the mean rate of teacher verbal praise increased from .17 to .37 and decreased from .51 to .23 after the introduction of the store phase in Ms. Elenor's and Ms. Penny's classrooms, respectively. Finally, following the implementaiton of the lottery phase the mean rate

of of teacher verbal praise decreased from .37 to .31 and increased from .23 to .25 in Ms. Elenor's and Ms. Penny's classrooms, respectively.

Although T/P combined with teacher verbal praise was not a defined dependent measure; since it was graphed for purposes of visual analysis it will be discussed further here. All four teachers demonstrated increases in the mean rate of T/P and teacher verbal praise with the introduction of PBIS procedures and either the store or lottery reinforcement system. During baseline the mean rate of T/P and teacher verbal praise was .73, .28, .17, and .51 for Ms. Lucy's, Ms. Molly Jo's, Ms. Eleanor's, and Ms. Penny's classrooms, respectively. After the implementation of the lottery phase in the first two classrooms the mean rate of teacher verbal praise increased to 1.07 and .58 in Ms. Lucy's and Ms. Molly Jo's classrooms, respectively. After moving to the store phase, the mean rate of teacher verbal praise decreased then to .90 and .32 in Ms. Lucy's and Ms. Molly Jo's classrooms, respectively. For the other two classrooms, the mean rate of teacher verbal praise increased to .54 and .76 after the introduction of the store phase in Ms. Elenor's and Ms. Penny's classrooms, respectively. Finally, following the implementation of the lottery phase the mean rate of of teacher verbal praise increased to .90 and decreased to .59 in Ms. Elenor's and Ms. Penny's classrooms, respectively.

Statistical Analysis

Multilevel Modeling

Average intervention effects and their statistical significance were calculated using multilevel models for multiple baseline designs (Ferron et al., 2009; Van den Noortgate & Onghena, 2003). The procedures utilized in multilevel modeling allow

for statistical inference despite heterogeneity in intervention effects across cases and serial dependence of scores within cases.

Estimates of fixed effects were calculated, which provide the average percentage of intervals that AEB was observed during baseline, the difference between baseline and the lottery phase or store phase, and the difference between the lottery phase and store phase (see Table 3). The average percentage of AEB in the baseline phase was 42.74%, the average percentage of AEB in lottery phase was 61.85%, and the average percentage of AEB in the store phase was 61.95%. The difference between AEB levels in baseline and interventions (i.e., store or lottery) was statistically significant ($p = .001$), but the difference in AEB levels between the lottery and store phases was not statistically significant. These effects were allowed to vary across classrooms in the models. Based on the observed data, one could expect that 95% of the time levels of percentages of AEB would improve by 11.79% to 25.99% with the addition of PBIS intervention procedures and that 95% of the time application of the store phase will result in a change in AEB of -11.05 to 11.41% as compared to the lottery phase.

Multilevel modeling also can measure first order autocorrelation of residuals. This value expresses the degree to which participants' repeated measures are correlated. The first order autocorrelation coefficient was $-.059$, which was not statistically significant. Effect size can also be calculated by dividing the difference between baseline and intervention means by the square root of the residual variance. This yields a standardized mean difference effect size similar to Cohen's (1988) d . This effect size value was 3.42 indicating mean levels of AEB increased by 3.42

standard deviations across PBIS intervention phases compared to baseline.

Standardized mean difference effect sizes for AB contrasts judged to be effective are commonly between 2 and 3 *SD* (Parker & Brossart, 2003; Parker et al., 2005).

Table 3

Multilevel Analyses Examining Differences between Conditions

Parameter	Estimate	<i>SE</i>
<u>Fixed Effects^a</u>		
Intercept (Baseline)	42.78**	1.41
Lottery vs. Baseline	18.89*	2.87
Store vs. Lottery	.18	3.45
<u>Covariance Parameters^b</u>		
Intercept	--	--
Lottery vs. Baseline	19.69	19.41
Store vs. Lottery	36.33	40.24
AC-1	-.05	.16
Residual	30.55	6.44

Note. The random intercept approached zero and was excluded from the final model. ^aFixed effects represent averages during baseline or the average differences between phases. ^bCovariance parameters include the variances of effects, the residual variance, and the first-order autocorrelation coefficient (AC-1). ** $p < .01$, * $p < .05$

Odds ratio. The odds ratio compares the ratios of improvement in the intervention and baseline phases (Parker & Hagan-Burke, 2007). Odds ratios comparing baseline phase to the combined effects of PBIS implementation procedures and the store or lottery phase are displayed in Table 4. The odds ratio for the intervention phase is the number of points that do not overlap with the baseline data over the number of points that do overlap with baseline data ($41/1 = 41$). In the baseline phase, the odds ratio is the number of points that do overlap with intervention data over the number of points that do not overlap ($1/13 = .076$). The odds ratio is $41/.076 = 539$, therefore the odds or likelihood of improvement in intervention (i.e., either lottery phase or store phase) is 539 times that of the baseline phase across all four classrooms.

Odds ratios comparing baseline phase to the store phase across all four classrooms are displayed in Table 5. With the implementation of the direct teaching and review of PBIS classroom expectations and rules the odds or likelihood of improvement in all three classrooms is 236 times that of the baseline phase. Finally, since no intervention data points overlapped with baseline data points in the lottery phase for and of the observations, calculating the odds ratio for the intervention phase would involve dividing by zero. As a result, the odds ratios of improvement for this phase cannot be calculated. However, the large standardized mean difference and the lack of overlapping data suggest a large effect.

Table 4

Clinical Outcomes for AEB for the Comparisons of Intervention Phase (the Combined Effects PBIS Implementation Procedures and Either the Lottery Phase or the Store Phase) and Baseline Phase across All Four Classrooms

Success Rate	Odds
Treatment	Treatment
$41/42 = 97.61\%$	$41/1 = 41/1$
Control	Control
$1/14 = 0.071\%$	$1/13 = 0.076/1$
Difference	Ratio
$97.61 - 0.071 = 97.53\%$	$41/0.076 = 539$

Table 5

Clinical Outcomes for AEB for the Comparisons of Store Phase and Baseline Phase across All Four Classrooms

Success Rate	Odds
Treatment	Treatment
$18/19 = 94.73\%$	$18/1 = 18/1$
Control	Control
$1/14 = 0.071\%$	$1/13 = 0.076/1$
Difference	Ratio
$94.73 - 0.071 = 94.65\%$	$18/0.076 = 236$

School Climate Survey

Teachers completed the American School Climate Survey prior to the implementation of either intervention (i.e., the store or lottery) as a measure of social validity (Perkins, 2006). The survey was administered immediately prior to the implementation of either phase and immediately after the implementation of the final phase in each classroom. Overall, most of the teacher's responses did not substantially differ from those endorsed prior to implementing classroom interventions. It is interesting to note that the three teachers with over 10 years of experience rated the overall school climate much higher than the teacher with under 10 years of experience (e.g., the teachers with 10+ years of experience endorsed that they strongly disagreed that most students at the school would not be successful at a community college or university while the teacher with less than 10 years of experience was not sure). However, all teachers endorsed that they believed that they addressed bullying appropriately, that administrators at their school trusted their professional judgement, and that students were capable of high achievement on standardized exams both before and after the implementation of both interventions.

CHAPTER IV

DISCUSSION

The establishment of a reinforcement system during the planning of PBIS is one of the identifying criteria of PBIS (Cohen et al., 2007; Horner et al., 2004; Kincaid et al., 2005). Throughout the PBIS literature, the most typical types of reinforcement systems either employ a lottery, a store, or a combination of both. Menousek (2010) assessed the effectiveness of the additive effects of PBIS procedures at the classroom level and determined that the effectiveness of the implementation of the direct teaching and review of PBIS classroom expectations and rules with T/P and a lottery did not substantially increase mean levels of students' AEB compared to the direct teaching and review of PBIS classroom with T/P. Kazdin and Bootzin (1972) described a conditioned reinforcer (e.g., a ticket or a token) as being interchangeable for a variety of backup reinforcers. Taking this into account, it was hypothesized that tokens that can be exchanged for backup reinforcers (i.e., guarantees of access to reinforcers) would be more effective at increasing students' AEB compared to tokens that provide the *chance* to attain a backup reinforcer. Therefore, the author's goal of this study was to compare the effects of two token reinforcement systems typically used in PBIS within-class procedures on AEB.

Research Question

The primary research question for this study sought to evaluate which intervention, a PBIS lottery or a PBIS store, is more effective at increasing student's AEB when included as part of a PBIS classroom system. Across all four classrooms,

statistical analysis by multilevel modeling does not support overall classroom differences but supports an overall difference of students' AEB between the PBIS lottery and PBIS store phases which is consistent with the visual analyses of the data. Visual analysis of the data between the lottery and store phase also suggests mixed results or no difference between the two interventions. That is, in two of the classrooms the mean percent of intervals that students' were observed to engage in AEB was slightly more during the PBIS lottery phase (i.e., 52.83 to 58.75 and 63.92 to 68.92 means of store compared to lottery phase in Ms. Lucy and Ms. Penny's classroom, respectively) and in two of the classrooms the mean intervals that students' were observed to engage in AEB was slightly more during the PBIS store phase (i.e., 59.44 to 69.04 and 58.33 to 61.80 means of lottery compared to store phase Ms. Molly Jo and Ms. Eleanor's classroom). Mixed results may be due to no difference between the two interventions or due to the short duration that classrooms were exposed to the interventions.

Although not included as a research question, the addition of PBIS procedures and either of the PBIS interventions substantially increased the mean number of observed intervals students were observed to engage in AEB compared to baseline. For example, although there are overlapping data points across the two PBIS interventions across classrooms, there is only one overlapping data point across both interventions and baseline data points across classrooms. Therefore, although no substantial mean differences were demonstrated across the two PBIS interventions, a large increase in students' mean observed intervals of AEB was observed for both interventions compared to what was observed during baseline. That is, across

classrooms, mean differences between percentage of intervals AEB was observed during baseline and PBIS procedures and the combination of both lottery and store phase were 44.44 to 56.78, 39.16 to 65.00, 44.44 to 60.23, and 43.75 to 66.74 for Ms. Lucy's, Ms. Molly Jo's, Ms. Eleanor's, and Ms. Penny's classrooms, respectively. This was also demonstrated through the use of statistical analysis or multilevel modeling. The average percentage of AEB in the baseline phase was 42.74%, the average percentage of AEB in lottery phase was 61.85%, and the average percentage of AEB in the store phase was 61.95%. The difference between AEB levels in baseline and interventions (i.e., store or lottery) was statistically significant ($p = .001$), but the difference in mean levels of AEB levels between the lottery and store phases was not. Since there were no overlapping data for AEB for the lottery phase compared to baseline phase, the odds ratios for the two interventions cannot be compared. However, odds or likelihood of students' AEB improvement for both interventions (i.e., either lottery phase or store phase) is 1142 times that of the baseline phase across all four classrooms.

There are different explanations that may attribute for results demonstrated in the different phases of this study. The first reason may be that teacher's differed in the type of praise provided to students when providing with a T/P. That is, some teachers said "good job," every time students were presented with a ticket. Other teachers may have provided specific and descriptive labeled praise to students while providing them with a T/P. Future studies should compare differences between generic praise and specific labeled praise at increasing student's AEB in a classroom-wide PBIS intervention.

Also, teachers differed in the times that they provided their students with T/P. That is, some teachers would provide their students with T/P throughout the lesson and during independent work. However, other teachers would wait until they were finished with their lesson and provide students with tickets only during independent work. For example, Ms. Eleanor commonly was not observed to provide her students with at least four token presentations combined with verbal praise during the 20-min observation. However, when treatment integrity was observed during the teacher implementation of the store, all of the students in Ms. Eleanor's classroom were observed to have tickets to turn in (i.e., no student was observed to not receive one ticket throughout the course of a week). Future research could investigate the effects that different quantities of tickets student's need to receive in order to demonstrate substantial increases in mean level of AEB per week. It would also be interesting for future research to examine whether the setting (i.e., during the lesson or at the end of the lesson) that students were provided with T/P had an effect on students' engagement in AEB in the classroom setting.

Limitations

The results of the present study suggest that both interventions (i.e., the PBIS lottery and PBIS store) were effective at increasing students' mean level of AEB compared to baseline. However, compared to each other, no substantial differences were noted between the two classroom interventions. However, several limitations to this current study exist. The first limitation addresses the small number data points that was collected in each phase in the four classrooms. The limited number of data points for each phase in all classrooms could be the reason why there was no

differentiation between the two different phases. Also, if primary investigators had ran conditions out further, differentiation between the two conditions may have been demonstrated. Future studies should compare the store and lottery interventions with a larger amount of data points in each phase. This may help differentiate which intervention (i.e., PBIS store or lottery) is more effective at increasing students' AEB.

The second limitation of the current investigation addresses the limitation of effect sizes and clinical outcome analyses. These measures (i.e., clinical outcome indices and effect sizes) reflect only the amount of change and fail to explain the cause of change. However, the internal validity of the current investigation is strengthened with the components of the multiple baseline procedures. Also, the fixed-effects estimates produced through multilevel models for multiple baseline designs are typically unbiased with level 2 sample sizes of at least four (Ferron et al., 2009). However, more classrooms would increase the level 2 sample size and allow for better estimation of level 2 effects. Future research should replicate these results to increase the number of classrooms added to the multilevel modeling analysis.

A final limitation that should be noted for the current investigation is the small sample size which is typical of single case experimental designs. Even though the use of single case design allows for the control of internal validity issues, the small sample size limits the overall generalizability of the current findings. However, the difference in grades taught, subjects observed, and teacher demographics (i.e., level of experience and education) aids in the generalizability of the current findings. Future research should include a variety of student ages and

socio-economic statuses, teacher demographics, and areas of instruction to expand the external validity of the current study.

The findings of the current investigation have one major practical implication for schools that are implementing a classroom-wide component of PBIS. That is, teachers have a choice as to which intervention system they want to implement (i.e., PBIS store or lottery). Based on this study's results, as long as teachers provided their students with classroom rules, have students read the rules once daily, and provide their students with T/P, teachers will improve students' engagement in AEB. Teachers also have the luxury of choosing which reinforcement system they would like to implement based on their time and resources and the perceived need of their students.

Summary


The purpose of the present study was to compare the effectiveness of two token reinforcement systems typically used in PBIS in increasing AEB in the classroom. Specifically, the current investigation compares the effects of a lottery and a store on AEB. The present results suggest that although the combination of both PBIS procedures and a lottery or store intervention substantially increased the mean level of observed intervals of students' AEB, no substantial difference between the two PBIS interventions (i.e., lottery or store) was demonstrated across the four classrooms.

The results of the current investigation contribute to the current literature that the classroom component of PBIS increases the percent interval occurrence of observable appropriate behaviors (Menousek, 2010). Also, the current investigation

was to compare two different procedures typically used to trade in tickets for rewards. Unfortunately, no substantial or significant differences between the two reinforcement procedures were demonstrated. Similar to the results found in Menousek (2010), it may be the case that students' engagement in appropriate behavior may be most affected by PBIS classroom reinforcement procedures alone (i.e., reading the rules and providing students for following the rules with verbal praise and a ticket) rather than the delayed reinforcement systems (i.e., the store or a lottery). That being said, it may be the case that in order for schools and classrooms to see increases in appropriate behavior, no specific reinforcement system is needed. Rather, PBIS procedures should be implemented in the classroom, and students should receive a ticket combined with verbal praise intermittently in order for increases in AEB to occur. The current findings are in support of previous PBIS studies indicating that a reinforcement procedure should be implemented in order for optimal decreases in disruptive behavior to be demonstrated (Cohen et al., 2007; Horner et al., 2004; Kincaid et al., 2005). In conclusion, although differences between the effects on AEB of the two different reinforcement systems (i.e., lottery and store) were not demonstrated, overall differences in AEB compared to baseline were not only visually substantial, but also statistically significant. Further research should continue to examine overall effectiveness of PBIS procedures at increasing students' appropriate behavior at the classroom level in order to optimize PBIS procedures.

APPENDIX A

INSTITUTIONAL REVIEW BOARD APPROVAL

	THE UNIVERSITY OF SOUTHERN MISSISSIPPI	
	Institutional Review Board	118 College Drive #5147 Hattiesburg, MS 39406-0001 Tel: 601.266.6820 Fax: 601.266.5509 www.usm.edu/irb

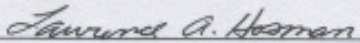
**HUMAN SUBJECTS PROTECTION REVIEW COMMITTEE
NOTICE OF COMMITTEE ACTION**

The project has been reviewed by The University of Southern Mississippi Human Subjects Protection Review Committee in accordance with Federal Drug Administration regulations (21 CFR 26, 111), Department of Health and Human Services (45 CFR Part 46), and university guidelines to ensure adherence to the following criteria:

- The risks to subjects are minimized.
- The risks to subjects are reasonable in relation to the anticipated benefits.
- The selection of subjects is equitable.
- Informed consent is adequate and appropriately documented.
- Where appropriate, the research plan makes adequate provisions for monitoring the data collected to ensure the safety of the subjects.
- Where appropriate, there are adequate provisions to protect the privacy of subjects and to maintain the confidentiality of all data.
- Appropriate additional safeguards have been included to protect vulnerable subjects.
- Any unanticipated, serious, or continuing problems encountered regarding risks to subjects must be reported immediately, but not later than 10 days following the event. This should be reported to the IRB Office via the "Adverse Effect Report Form".
- If approved, the maximum period of approval is limited to twelve months.

Projects that exceed this period must submit an application for renewal or continuation.

PROTOCOL NUMBER: 29101101
 PROJECT TITLE: **A Comparison of the Effects of Two PBIS Token Reinforcement Systems on Appropriately Engaged Classroom Behavior**
 PROPOSED PROJECT DATES: 11/01/09 to 07/01/10
 PROJECT TYPE: **Dissertation or Thesis**
 PRINCIPAL INVESTIGATORS: **Kathryn M. Menousek**
 COLLEGE/DIVISION: **College of Education & Psychology**
 DEPARTMENT: **Psychology**
 FUNDING AGENCY: **N/A**
 HSPRC COMMITTEE ACTION: **Expedited Review Approval**
 PERIOD OF APPROVAL: **10/13/09 to 10/12/10**

 _____ Lawrence A. Hosman, Ph.D. HSPRC Chair	10-14-09 _____ Date
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APPENDIX B

TEACHER CONSENT FORM

University of Southern Mississippi

Consent Document for Research Participants

Title of Study:

A Comparison of the Effects of Two PBIS Token Reinforcement Systems on Appropriately Engaged Behavior

Purpose

You are being asked to participate in a study that is aimed at identifying which reinforcement system (i.e., lottery or store) is more effective in increasing students AEB in the classroom.

Participants:

Your students must be enrolled in a general education classroom. The students in your classroom must engage in appropriate behavior in no more than 50% of the observed intervals in a 20-min classroom screening observation. If your classroom does not meet criteria a school psychologist-in-training at USM may still provide you with assistance for other ways to address your classroom's problem behaviors.

Procedure:

If you agree to be in this study and if your classroom is selected for the study, you will be asked to give instructions to your classroom in the same manner that you would on a regular basis. If your classroom is observed to engage in appropriate behavior no more than 50% of the observed intervals in a 20-min classroom screening observation, at least two more observations will be conducted in this same manner. Next, you would then meet with the primary investigator to create a set of rules. Following this you would teach the rules of the class to your students. You would also award your students by giving them a token with verbal praise. Finally, either the tokens you award students will then be put in a drawing at the end of the week to win a pre-determined prize or be redeemed in a weekly store. The experimenter and a trained graduate student will observe you and your classrooms' behavior to see if there is a difference in your classrooms' engagement in appropriate behavior based on the procedures used.

Benefits/Risks to Participant:

Your participation in the study may help you increase your students' engagement in appropriate behavior in the classroom. One possible risk includes continued misbehavior of students. Your students' will be given tokens with verbal praise for engagement in appropriate behavior.

Voluntary Nature of the Study/Confidentiality:

Your participation in this study is entirely voluntary and you may refuse to complete the study at any point during the experiment, or refuse to answer any questions with which you are uncomfortable. In addition, all information obtained during the study will be kept confidential. All information that may identify you will be withheld. Your name and other identifying information will not be used in the research papers, any submission to a professional journal for publication, or presentation. The only circumstances in which we would release information about you or your students would be if one of your students tells use he/she is a harm to self or others, if one of your students is abused, if the release of information is court ordered, or if there is a medical emergency in which release of information is important for someone's safety.

Contacts and Questions:

At any time you may withdraw from the study or ask any questions you may have regarding this study. Questions concerning the research should be directed at Kathryn Menousek or Dr. Joe Olmi at (601) 266-5255 or via email at kathryn.menousek@usm.edu or d.olmi@usm.edu. This project has been reviewed by the Human Subjects Protection Review Committee, which ensures that research projects involving human subjects follow federal regulations. Any questions or concerns about rights as a research subject should be directed to the chair of the Institutional Review Board, The University of Southern Mississippi, 118 College Drive #5147, Hattiesburg, MS 39406-0001, (601) 266-6820. A copy of this form will be given to the participant.

Participant's Consent:

I have had the purposes and procedures of this study explained to me and have had the opportunity to ask questions. My questions have been answered to my satisfaction, and I am voluntarily signing this form for me to participate in this research study. My signature shows my willingness to allow me to participate in this study under the conditions stated.

This Section to be Completed by Teacher

Name of Teacher

Date

APPENDIX C

CLASSROOM RULES OBSERVATION FORM/TREATMENT INTEGRITY

Teacher name: _____ Date: _____ Observer name: _____ Classroom Activity: _____

Interval	1.1	1.2	1.3	1.4	1.5	1.6	2.1	2.2	2.3	2.4	2.5	2.6
TP												
AEB												
Praise												
Interval	3.1	3.2	3.3	3.4	3.5	3.6	4.1	4.2	4.3	4.4	4.5	4.6
TP												
AEB												
Praise												
Interval	5.1	5.2	5.3	5.4	5.5	5.6	6.1	6.2	6.3	6.4	6.5	6.6
TP												
AEB												
Praise												
Interval	7.1	7.2	7.3	7.4	7.5	7.6	8.1	8.2	8.3	8.4	8.5	8.6
TP												
AEB												
Praise												
Interval	9.1	9.2	9.3	9.4	9.5	9.6	10.1	10.2	10.3	10.4	10.5	10.6
TP												
AEB												
Praise												

Number of Token Presentation with Verbal Praise System: _____

Appropriately Engaged Behavior: _____

Phase: _____

Praise: _____

Teacher name: _____ Date: _____ Observer name: _____ Classroom Activity: _____

Interval	11.1	11.2	11.3	11.4	11.5	11.6	12.1	12.2	12.3	12.4	12.5	12.6
TP												
AEB												
Praise												
Interval	13.1	13.2	13.3	13.4	13.5	13.6	14.1	14.2	14.3	14.4	14.5	14.6
TP												
AEB												
Praise												
Interval	15.1	15.2	15.3	15.4	15.5	15.6	16.1	16.2	16.3	16.4	16.5	16.6
TP												
AEB												
Praise												
Interval	17.1	17.2	17.3	17.4	17.5	17.6	18.1	18.2	18.3	18.4	18.5	18.6
TP												
AEB												
Praise												
Interval	19.1	19.2	19.3	19.4	19.5	19.6	20.1	20.2	20.3	20.4	20.5	20.6
TP												
AEB												
Praise												

Number of Token Presentation with Verbal Praise System: _____





Appropriately Engaged Behavior: _____

Phase: _____

Praise: _____

APPENDIX D

SAMPLE TICKETS FOR MS. JACKSON'S CLASS

<p>You have been caught following Ms. Jackson's classroom rules!</p>  <p>Keep up the Great Work!</p>	<p>You have been caught following Ms. Jackson's classroom rules!</p>  <p>Keep up the Great Work!</p>
<p>You have been caught following Ms. Jackson's classroom rules!</p>  <p>Keep up the Great Work!</p>	<p>You have been caught following Ms. Jackson's classroom rules!</p>  <p>Keep up the Great Work!</p>

APPENDIX E

EXAMPLES OF TEACHER'S CLASSROOM RULES

Rules for Classrooms

Ms. Lucy

1. Enter Ms. Savage's room quietly and quickly get to work
2. Sit with your feet and legs under the desk
3. Talk only after you have raised your hand and have been called upon
4. Track with your fingers when you read
5. Come to class with your pencil sharpened and with your reading book

Ms. Molly Jo

1. Follow instructions the first time they are given
2. Talk only after you have raised your hand and have been called upon
3. Complete all of your work on time
4. Use kind words when talking to your classmates
5. Have all material prepared at the beginning of instruction

Ms. Eleanor

1. Keep your eyes on the teacher during instruction
2. Follow instructions the first time they are given
3. Talk only after you have raised your hand have been called upon
4. Complete all of your work on time
5. Keep your hands and feet to yourself

Ms. Penny

1. Keep your eyes on the teacher during instruction
2. Follow instructions the first time they are given
3. Talk only after you have raised your hand and have been called upon
4. Complete all of your work on time
5. Use kind words when talking to your classmates

APPENDIX F

DIRECT TEACHING AND REVIEW OF THE PBIS CLASSROOM

EXPECTATIONS AND RULES/TREATMENT INTEGRITY CHECKLIST

1. Introduces each rule individually.
2. Give examples of appropriate rule following for each rule.
3. Describe and demonstrate rule components (i.e., description and/or definition of rule vocabulary).
4. Conducts these steps once, prior to the beginning of the instruction period.

Sample Script for Direct Teaching and Review of PBIS Classroom Expectations and Rules: Expectation One

Teacher	Student
“Today we’re going to talk about the rules for our classroom. First we’ll talk about what rules we follow when I am teaching a lesson to you.” (Point to each rule as you say it.)	
“The first rule for lesson time is, ‘Walk quietly in the classroom.’ What is the first rule?” (Signal)	
	“Walk quietly to your seat.”
“Right. That means that when you are moving around the classroom you are walking and not talking to other students.”	
“Here’s the second rule for lesson time; ‘Follow the teacher’s instructions.’ What’s the second rule?” (Signal)	
	“Follow the teacher’s instructions.”
“Right. That means that when I tell you to do something, you begin the task the first time I tell you to do it.”	
“Now . . . by yourselves.” (Pause) “Get ready.” (Point to each rule as students say the rules)	
	“Walk quietly in the classroom. Follow the teacher’s instructions.”
“Very nice. Now let’s practice doing what the rules say. I’m going to begin teacher a lesson. I want you to concentrate on following the rules during this practice time.” (Place the rules poster near where you are standing most of the class period so that student can see it easily without diverting their attention from you.)	
Begin teacher the regularly scheduled lesson. Review the rules 2 times a day in the same manner outlined previously.	
“Now . . . by yourselves.” (Pause) “Get ready.” (Point to each rule as students say the rules)	

APPENDIX G

BEHAVIORAL ROLE MODELING OF THE CLASSROOM RULES

1. Instruct the teacher to silently read each rule out loud to the primary investigator as if she were teaching the class.
2. The primary investigator will then role play, acting as a student.
3. Instruct the teacher to respond to the primary investigator as if he/she was a student in the class.
4. The primary investigator will provide the teacher with feedback and answer any questions concerning the direct teaching of the PBIS classroom expectations and rules.

APPENDIX H

TOKEN PRESENTATION WITH VERBAL PRAISE

(Also serves as treatment integrity checklist)

1. Appropriate responses to classroom rules should be praised with token presentation approximately once every five minutes for a total of at least four tickets per 20-min observation.
2. The token presentation with verbal praise should be explicitly linked to the appropriate behavior (e.g., “Betty, I like the way you raised your hand to talk.”).
3. The teacher should present tokens to each row or grouping of students. She should be instructed to seek out students from each row of seats or grouping of students.

APPENDIX I

LOTTERY STEPS

(Also serves as treatment integrity checklist)

1. Lottery is held every Friday (or on the last day of the school week).
2. The teacher will draw four tickets out of the lottery box.
3. If a student's name is drawn more than once, he or she will not receive two rewards. Instead, the student's name will be moved to the side and the teacher will draw another ticket from the Lottery box.
4. Students whose names are drawn from the lottery will be allowed to choose from the list of rewards determined during the reward suggestion.

APPENDIX J

EXAMPLES OF REWARDS SELECTED IN EACH CLASSROOM, NUMBER OF
VOTES PER REWARD, AND COST OF EACH REWARD

Ms. Lucy's Classroom

1. Treasure box – 0 votes – 5 tickets
2. Candy – 1 vote – 10 tickets
3. Computer time – 0 votes – 5 tickets
4. Free time (puzzles, games) – 11 votes – 20 tickets
5. Write on the promethean board – 2 votes – 15 tickets
6. Line leader – 1 vote - 10 tickets
7. Wash tables – 0 votes – 5 tickets
8. Stickers – 0 votes – 5 tickets
9. Teacher's Helper – 1 vote – 10 tickets

Ms. Molly Jo's Classroom

1. Stickers – 0 votes – 1 ticket
2. Candy – 2 votes – 10 tickets
3. Pencils – 1 vote – 5 tickets
4. Tattoos – 14 votes – 15 tickets
5. Bracelets – 0 votes – 1 ticket
6. Coloring books – 2 votes – 10 tickets
7. Toys (yo-yo's; cars) – 2 votes – 10 tickets

Ms. Eleanor's Classroom

1. Stickers – 1 vote – 5 tickets
2. Candy – 0 votes – 1 ticket
3. Toys – 4 votes – 15 tickets
4. Line Leader – 1 vote – 5 tickets
5. Table Washer – 1 vote – 5 tickets
6. Computer time – 3 votes – 10 tickets
7. Homework Pass – 10 votes – 20 tickets
8. Teacher's Helper – 1 vote – 5 tickets

Ms. Penny's Classroom

1. Candy – 2 votes – 10 points
2. Tiny notebooks – 2 votes – 10 points
3. Toys (cars, yo-yo's) – 1 votes – 5 points
4. Tattoos – 8 votes – 20 points
5. Bracelet – 6 votes – 15 points
6. Pencils – 0 votes – 1 points

APPENDIX K

SELECTION OF REWARDS FOR ALL CLASSROOMS FOR THE LOTTERY AND
STORE PHASE

1. During consultation the teacher and the primary investigator will discuss activities readily available in the natural environment that students may be motivated to work for (i.e., teacher's helper, classroom leader, extra time with the teacher, extra computer time, line leader; McLaughlin & Malaby, 1972). In addition, the teacher and the primary investigator will discuss tangible reinforcers that students may be motivated to work for (i.e., pencils, stickers, candy, treasure box; Menousek, 2009). During consultation the primary investigator will also ask the teacher what she observes the students interacting with in their free time to aid in the development of possible rewards (Jenson et al., 1997).
2. The teacher will then present students with the list generated during consultation prior to the introduction of either the lottery or store intervention. During this time, the teacher will be instructed to write the different rewards on the board.
3. After the teacher writes the different rewards on the board she will ask the students to provide suggestions on possible rewards they want added to the list. The teacher of the classroom will be instructed to use his/her digression on whether the suggested rewards are appropriate. The students will be then instructed to vote on which rewards they want included in the lottery or store (McLaughlin & Malaby, 1972).
4. The students will then vote on the listed rewards and the teacher will keep track of the number of votes earned for each reward. The students will be instructed to only vote once for a reward.
5. After the rewards have been ranked by the students through the use of the vote, the teacher will inform the students that all rewards will be included in the lottery or store.

APPENDIX L

STORE STEPS

(Also serves as treatment integrity checklist)

1. Every Friday (or the last day of the school week) the teacher will allow students to redeem their tokens for rewards.
2. The price of the rewards will be determined based on the classrooms ranking of the rewards during the reward selection. The rewards that cost the most points will be those that received the most votes during the reward selection procedure. Rewards that received no votes during the reward selection will cost the least amount of tickets (i.e., 1 ticket).
3. Teachers will be instructed to assign the rewards that fall the highest number of votes and no votes based on a continuum. That is, the rewards will be rank ordered based on the classroom vote and the number of tickets will increase in 5 point increments beginning with the second to last ranked reward (i.e., 0 votes will cost one point, the second to last ranked reward will cost 5 tickets, the third to last ranked reward will cost 10 tickets, the fourth to last ranked reward will cost 15 tickets, etc.).
4. Students will be divided into groups of five and will be provided no more than two minutes to inform the teacher as to which reward they wish to purchase. Also, students will have the option during this time to inform the teacher that they wish to save their tickets for the next weeks store in order to buy a more expensive reward.
5. Every student should be provided the opportunity to participate in the store.
6. After students have turned in their tickets for a reward, the tickets will be discarded. If the reward is a continuous privilege (i.e., group captain, teacher's helper) the student will be provided with the given reward until the implementation of the next store.

REFERENCES

- Ayllon, T. & Azrin, N. H. (1965). The measurement and reinforcement of behavior of psychotics. *Journal of Experimental Analysis of Behavior*, 8, 357-383.
- Ayllon, T., & Azrin, N. H. (1968). Reinforcer sampling: A technique for increasing the behavior of mental patients. *Journal of Applied Behavior Analysis*, 1, 13-20.
- Azrin, N. H., & Holz, W. C. (1966). Punishment. In W. R. Honig (Ed.), *Operant behavior: Areas of research and application* (pp. 380-447). New Jersey, NJ: Prentice Hall.
- Bandura, A. (1969). *Principals of behavior modification*. New York, NY: Holt, Rinehart, and Winston.
- Barlow, D. H., & Hersen, M. (1984). *Single case experimental designs: Strategies for studying behavior change* (2nd ed.). New York, NY: Pergamon.
- Baer, D. M., Wolf, M. M., & Risley, T. R. (1968). Some current dimensions of applied behavior analysis. *Journal of Applied Behavior Analysis*, 1, 91-97.
- Bohanon, H., Fenning, P., Carney, K. L., Minnis-Kim, M. J., Anderson-Harriss, S., Moroz, K. B., . . . Pigott, T. D. (2006). Schoolwide application of positive behavior support in an urban high school: A case study. *Journal of Positive Behavior Interventions*, 3, 131-145.
- Boostrom, R. (1991). The nature and functions of classroom rules. *Curriculum Inquiry*, 21, 193-216.
- Boren, J. J., & Colman, A. D. (1970). Some experiments on reinforcement principles within a psychiatric ward for delinquent soldiers. *Journal of Applied Behavior Analysis*, 3, 29-37.

- Brophy, J. E. (1983). Classroom organization and management. *Elementary School Journal*, 83, 264-285.
- Carr, E. G., Dunlap, G., Horner, R. H., Koegel, R. L., Turnbull, A. P., Sailer, W., . . . Fox, L. (2002). Positive behavior support: Evolution of an applied science. *Journal of Positive Behavioral Interventions*, 4, 4-16.
- Center on Positive Behavioral Interventions and Support. (n.d.). *What is a systems approach in school-wide PBS?* Retrieved from <http://www.pbis.org>
- Cohen, R., Kincaid, D., & Childs, K. E. (2007). Measuring school-wide positive behavior support implementation: Development and validation of the benchmarks of quality. *Journal of Positive Behavior Interventions*, 9, 203-213.
- Crawford, D. J., Vancouver, N., & McLaughlin, T. F. (1982). Token reinforcement of on-task behavior in a secondary special education setting. *Behavioral Engineering*, 7, 109-117.
- Dunlap, G., Carr, E. G., Horner, R. H., Zarcone, J. R., & Schwartz, I. (2009). Positive behavior support and applied behavior analysis: A familial alliance. *Behavior Modification*, 32, 682-698.
- Emmer, E. T., Evertson, C. M., & Anderson, L. M. (1980). Effective classroom management at the beginning of the school year. *Elementary School Journal*, 80, 219-231.
- Ferron, J. M., Bell, B. A., Hess, M. R., Rendina-Gobioff, G., & Hibbard, S. T. (2009). Making treatment effect inferences from multiple-baseline data: The utility of multilevel modeling approaches. *Behavior Research Methods*, 41, 372-384.

- Filcheck, H. A., McNeil, C. B., Greco, L. A., & Bernard, R. S. (2004). Using a whole-class token economy and coaching of teacher skills in a preschool classroom to manage disruptive behavior. *Psychology in the Schools, 41*, 351-361.
- George, M. P., White, G. P., & Schlaffer, J. J. (2007). Implementing school-wide behavior change: Lessons from the field. *Psychology in the Schools, 44*, 41-51.
- Gettinger, M. (1988). Methods of proactive classroom management. *School Psychology Review, 17*, 227-242.
- Gresham, F. M. (1989). Assessment of treatment integrity in school consultation and prereferral interventions. *School Psychology Review, 18*, 37-50.
- Grimm, K. J., Steele, J. S., Mashburn, A. J., Burchinal, M., & Pianta, R. C. (2010). Early behavioral associations of achievement trajectories. *Developmental Psychology, 46*, 976-983.
- Hayes, S. C., Barlow, D. H., & Nelson-Gray, R. O. (1999). *The scientist practitioner: Research and accountability in the age of managed care*. Needham Heights, MA: Allyn & Bacon.
- Hebert, K. A. (1997). *An empirical study of classroom rules* (Unpublished master's thesis). The University of Southern Mississippi, Hattiesburg, MS.
- Horner, R. H., Dunlap, G., Koegel, R. L., Carr, E. G., Sailor, W., Anderson, J., . . . O'Neill, R. E. (1990). Toward a technology of "nonaversive" behavioral support. *Journal of the Association for Persons with Severe Handicaps, 13*, 125-132.
- Horner, R. H., Todd, A. W., Lewis-Palmer, T., Irvin, L. K., Sugai, G., & Boland, J. B. (2004). The school-wide evaluation tool (SET): A research instrument for

- assessing school-wide positive behavior support. *Journal of Positive Behavior Interventions*, 6, 3-12.
- Horner, R. H., Dunlap, G., Koegel, R. L., Carr, E. G., Sailor, W., Anderson, J., O'Neill, R. E. (2005). Toward a technology of "nonaversive" behavioral support. *The Journal of the Association for the Severely Handicapped*, 15, 3-10.
- Individuals with Disabilities Education Improvement Act (IDEA 2004), PL. 108-446 (2004).
- Jenson, W. R., Rhode, G., & Reavis, H. K. (1997). *The tough kid tool box*. Longmont, CO: Sopris West.
- Johnson, T. C., Stoner, G., & Green, S. K. (1996). Demonstrating the experimenting society model with classwide behavior management intervention. *School Psychology Review*, 25, 199-214.
- Kartub, D. T., Taylor-Greene, S., March, R. E., & Horner, R. H. (2000). Reducing hallway noise: A systems approach. *Journal of Positive Behavior Interventions*, 2, 179-182.
- Kazdin, A. E. (1977). Joseph Lancaster and behavior modification in education. *Journal of the History of the Behavioral Sciences*, 13, 261-266.
- Kazdin, A. E. (1982). *Single-case research designs*. New York, NY: Oxford University Press.
- Kazdin, A. E. (1984). *Behavior modification in applied settings*. Homewood, IL: Dorsey Press.
- Kazdin, A. E., & Bootzin, R. R. (1972). The token economy: An evaluative review. *Journal of Applied Behavior Analysis*, 5, 343-372.

- Kelleher, R. T., & Gollub, L. R. (1962). A review of positive condition reinforcement. *Journal of Experimental Analysis of Behavior*, 5, 543-597.
- Kincaid, D., Childs, K., & George, H. (2005). *School-wide benchmarks of quality*. Unpublished instrument, University of South Florida.
- Kincaid, D., Knoster, T., Harrower, J. K., Shannon, P., & Bustamante, S. (2002). Measuring the impact of positive behavior support. *Journal of Positive Behavior Interventions*, 4, 109-117.
- Luiselli, J. K., Putnam, R. F., & Sunderland, M. (2002). Longitudinal evaluation of behavior support intervention in a public middle school. *Journal of Positive Behavior Interventions*, 4, 182-188.
- McCurdy, B. L., Mannella, M. C., & Eldridge, N. (2003). Positive behavior support in urban schools: Can we prevent the escalation of antisocial behavior? *Journal of Positive Behavior Intervention*, 5, 158-170.
- McLaughlin, T. F., & Malaby, J. E. (1972). Intrinsic reinforcers in a classroom token economy. *Journal of Applied Behavior Analysis*, 5, 263-270.
- McLaughlin, T. F., & Malaby, J. E. (1975a). Increasing and maintaining note-taking behavior in a sixth grade token classroom: An analysis of consequences presented in a delayed manner. *Journal of Human Behavior*, 12, 15-23.
- McLaughlin, T. F., & Malaby, J. E. (1975b). The effects of various token reinforcement contingencies on assignment completion and accuracy during variable and fixed token exchange schedules. *Canadian Journal of Behavioral Science*, 7, 411-419.
- McLaughlin, T. F., & Malaby, J. E. (1976). An analysis of assignment completion and accuracy across time under fixed, variable, and extended token exchange periods

- in a classroom token economy. *Contemporary Educational Psychology*, 1, 346-355.
- Meichenbaum, D. H., Bowers, K. S., & Ross, R. R. (1968). Modification of classroom behavior of institutionalized female adolescent offenders. *Behavioral Research & Therapy*, 6, 343-353.
- Menendez, A. L., Payne, L. D., & Mayton, M. R. (2008). The implementation of positive behavioral support in an elementary school: Processes, procedures, and outcomes. *The Alberta Journal of Educational Research*, 54, 448-462.
- Menousek, K. M. (2010). *An investigation of the classroom component of positive behavior intervention and support system on appropriately engaged behavior* (Unpublished master's thesis). The University of Southern Mississippi, Hattiesburg, MS.
- Metzler, C. W., Biglan, A., Rusby, J. C., & Sprague, J. R. (2001). Evaluation of a comprehensive behavior management program to improve school-wide positive behavior support. *Education and Treatment of Children*, 24, 448-479.
- Miller, D. N., George, M. P., & Fogt, J. B. (2005). Establishing and sustaining research-based practices at centennial school: A descriptive case study of systemic change. *Psychology in the Schools*, 42, 553-567.
- Nelson, J. R., Benner, G. J., Reid, R. C., Epstein, M. H., & Currin, D. (2002). The convergent validity of office discipline referrals with the CBCL-TRF. *Journal of Emotional and Behavioral Disorders*, 10, 181-188.

- Netzel, D. M., & Eber, L. (2003). Shifting from Reactive to proactive discipline in an urban school district: A change of focus through PBIS implementation. *Journal of Positive Behavior Interventions*, 2, 71-79.
- No Child Left Behind Act of 2001, Pub. L. No. 107-110, 115 Stat. 1425 (2002).
- Parker, R. I., & Hagan-Burke, S. (2007). Single case research results as clinical outcomes. *Journal of School Psychology*, 45, 637-653.
- Parker, R. I., Brossart, D. F., Vannest, K. J., Long, J. R., De-Alba, R. G., Baugh, F. G., . . . Sullivan, J. R. (2005). Effect sizes in single case research: How large is large? *School Psychology Review*, 34, 116-132.
- Perkins, B. K. (2006). *American School Climate Survey – Teacher Survey*. Retrieved from <http://schoolclimatesurvey.com/html/surveys.htm>
- Scott, T. M., & Barrett, S. B. (2004). Using staff and student time engaged in disciplinary procedures to evaluate the impact of school-wide PBS. *Journal of Positive Behavior Interventions*, 6, 21-27.
- Sprague, J. Walker, H., Golly, A., White, K., Myers, D. R., & Shannon, T. (2001). Translating research into effective practice: The effects of a universal staff and student intervention on indicators of discipline and school safety. *Education and Treatment of Children*, 24, 495-511.
- Sugai, G., & Horner, R. H. (2002). Introduction to the special series on positive behavior support in schools. *Journal of Emotional and Behavioral Disorders*, 10, 130-135.
- Sugai, G., & Horner, R. H. (2006). A promising approach for expanding and sustaining school-wide positive behavior support. *School Psychology Review*, 35, 245-259.

- Sugai, G., & Horner, R. H. (2008). What we know and need to know about preventing problem behaviors in schools. *Exceptionality, 16*, 67-77.
- Sugai, G., Horner, R. H., Dunlap, G., Hieneman, M., Lewis, T. J., Nelson, C. M., . . . Turnbull, H. R. (2000). Applying positive behavior support and functional behavioral assessment in schools. *Journal of Positive Behavioral Interventions, 2*, 131-143.
- Sugai, G., Horner, R. H., & Todd, A. W. (2000). *Effect behavior support: Self-assessment survey*. Eugene, OR: University of Oregon, Positive Behavioral Intervention and Supports Technical Assistance Center.
- Sugai, G., Sprague, J. R., Horner, R. H., & Walker, H. M. (2000). Preventing school violence: The use of office discipline referrals to assess and monitor school-wide discipline interventions. *Journal of Emotional and Behavioral Disorders, 8*, 94-101.
- Taylor-Greene, S. J., & Kartub, D. T. (2000). Durable implementation of school-wide behavior support: The high five program. *Journal of Positive Behavior Intervention, 4*, 233-235.
- Technical Assistance Center on Positive Behavior Interventions & Supports: Effect Schoolwide Intervention (n.d.). *Secondary level prevention*. Retrieved from <http://www.pbis.org>
- Van den Noortgate, W., & Onghena, P. (2003). Combining single-case experimental data using hierarchical linear models. *School Psychology Quarterly, 18*, 325-346.

Walker, B., Cheney, D., Stage, S., & Blum, C. (2005). School-wide screening and positive behavior supports: Identifying and supporting students at risk for school failure. *Journal of Positive Behavior Interventions*, 7, 194-204.

